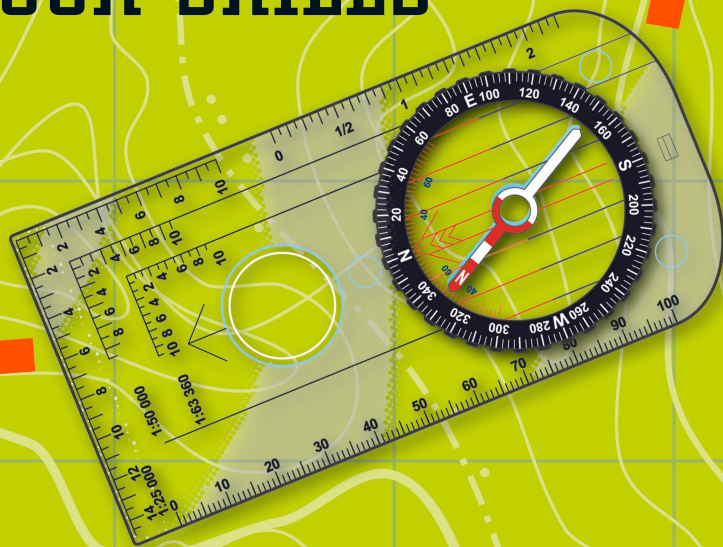


# SURVIVAL FOR BEGINNERS

A STEP-BY-STEP GUIDE TO  
CAMPING AND OUTDOOR SKILLS



COLIN TOWELL



# SURVIVAL FOR BEGINNERS







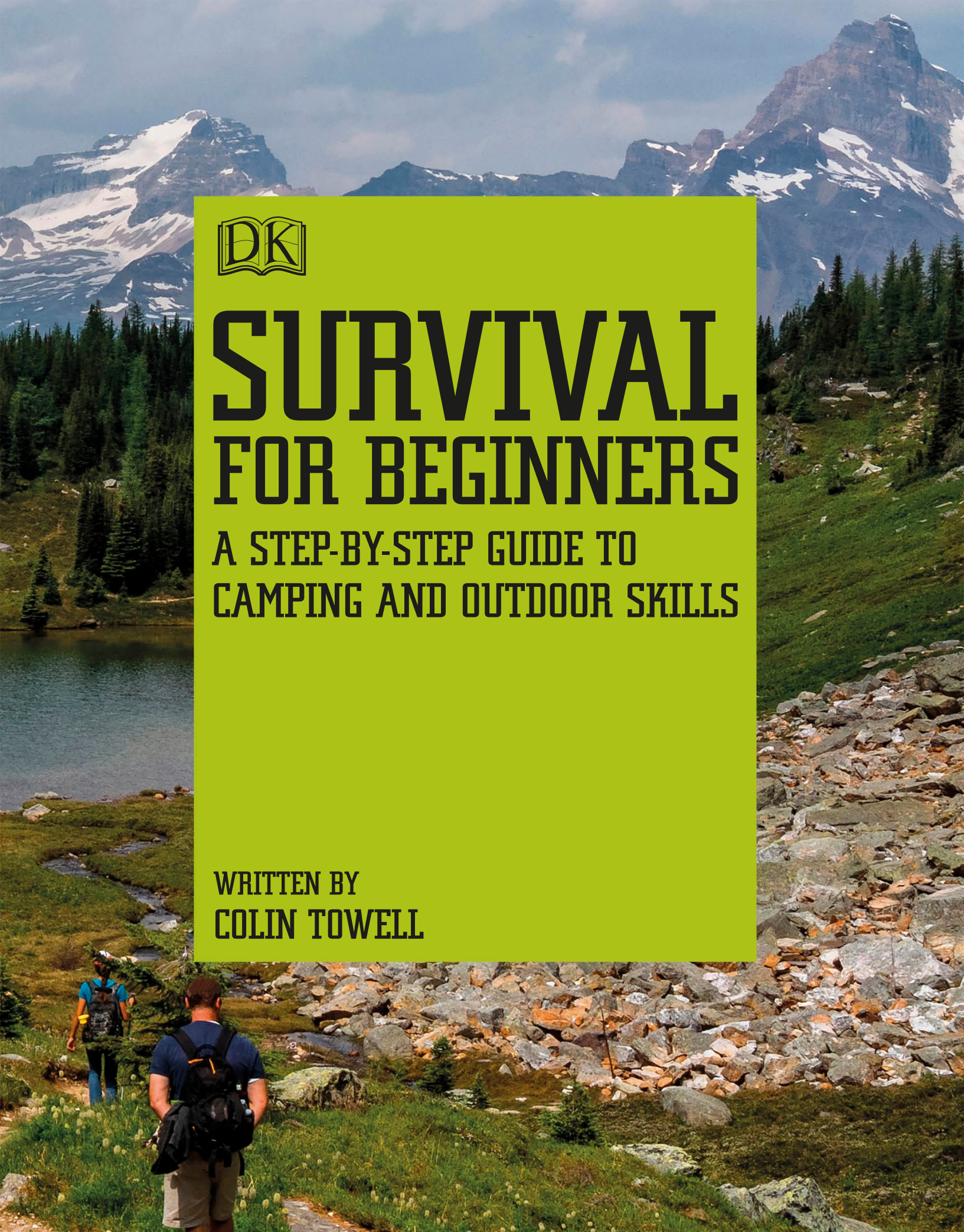




# **SURVIVAL FOR BEGINNERS**

**A STEP-BY-STEP GUIDE TO  
CAMPING AND OUTDOOR SKILLS**

**WRITTEN BY  
COLIN TOWELL**







Penguin  
Random  
House

**Senior Editor** Carron Brown

**Senior Designer** Sheila Collins

**Designer** Kit Lane

**Editors** Ann Baggaley, Jessica Cawthra,

Sarah Edwards, Anna Streiffert Limerick,

Georgina Palffy, Alison Sturgeon, Hannah Wilson

**Designers** Chrissy Barnard, Rachael Grady

**Illustrations** Dynamo Ltd, SJC – Stuart Jackson Carter,

Good Illustration, KJA, Gus Scott

**Managing Editor** Francesca Baines

**Managing Art Editor** Philip Letsu

**Producer, Pre-Production** Andy Hilliard

**Producer** Jude Crozier

**Jacket Editor** Emma Dawson

**Jacket Designer** Suhita Dharamjit

**Senior DTP Designer** Harish Aggarwal

**Jackets Editorial Coordinator** Priyanka Sharma

**Managing Jackets Editor** Saloni Singh

**Jacket Design Development Manager** Sophia MTT

**Publisher** Andrew Macintyre

**Art Director** Karen Self

**Associate Publishing Director** Liz Wheeler

**Design Director** Phil Ormerod

**Publishing Director** Jonathan Metcalf

First published in Great Britain in 2019 by

Dorling Kindersley Limited

80 Strand, London, WC2R 0RL

A Penguin Random House Company

Copyright © 2019 Dorling Kindersley Limited

2 4 6 8 10 9 7 5 3 1

001–310146–May/2019

All rights reserved.

No part of this publication may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form, or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the prior written permission of the copyright owner.

A CIP catalogue record for this book  
is available from the British Library.

**Disclaimer:** Whilst the publisher has taken all reasonable care that the advice given in this book is correct, it is not engaged in providing specific advice to individual readers. The publisher can therefore not accept any liability for any loss or injury sustained by anyone following the advice in this book.

ISBN: 978-0-2413-3989-3

Printed and bound in China

A WORLD OF IDEAS:

SEE ALL THERE IS TO KNOW

[www.dk.com](http://www.dk.com)

# CONTENTS



|                  |    |
|------------------|----|
| Foreword         | 6  |
| Prepare yourself | 8  |
| Kit layers       | 9  |
| Survival tin     | 10 |



## NAVIGATION 12

|                         |    |
|-------------------------|----|
| How to read a map       | 14 |
| Understanding maps      | 16 |
| Visualizing relief      | 17 |
| Use a compass           | 18 |
| Navigate with a compass | 20 |
| Find north by day       | 22 |
| Find north by night     | 23 |
| Find north by the stars | 24 |
| Find south by the stars | 25 |
| Nature's own signposts  | 26 |
| Using GPS technology    | 28 |
| Leave an action plan    | 30 |
| What to do when lost    | 32 |
| Call for help           | 34 |
| Build a signal fire     | 36 |





## ON THE TRAIL

38

|                         |    |
|-------------------------|----|
| Travelling on foot      | 40 |
| Forecasting the weather | 42 |
| Insects and arachnids   | 44 |
| Animal encounters       | 46 |
| Animal signs            | 50 |
| Avoid heat injury       | 52 |
| Escape quicksand        | 53 |
| Moving over snow        | 54 |
| Making snowshoes        | 56 |
| Ice axe self-arrest     | 57 |
| Dressing for survival   | 58 |
| Survive an avalanche    | 60 |
| Cross a river           | 62 |
| Build a raft            | 64 |
| Canoe rescue            | 66 |
| Cold water shock        | 67 |
| Escape a crocodile      | 68 |
| Deal with a shark       | 69 |
| Adrift at sea           | 70 |

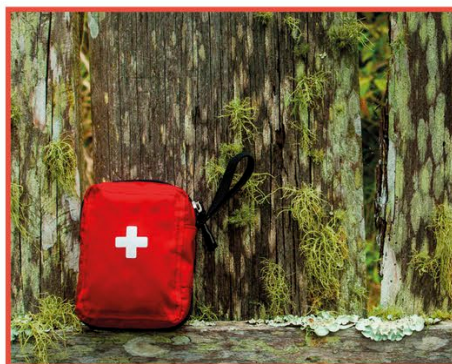


## CAMPCRAFT

72

|                         |    |
|-------------------------|----|
| Choosing a camping spot | 74 |
| Tent basics             | 76 |
| Campsite safety         | 78 |
| Tying knots             | 80 |

|                         |     |
|-------------------------|-----|
| Natural shelter         | 84  |
| A-frame shelter         | 86  |
| Make a tarp shelter     | 88  |
| Staying clean           | 90  |
| Using a pocketknife     | 92  |
| Making a feather stick  | 94  |
| Making sparks           | 95  |
| How to build a fire     | 96  |
| Survive a fire          | 98  |
| The importance of water | 100 |
| What is dehydration?    | 101 |
| Collecting water        | 102 |
| Purifying water         | 103 |
| The importance of food  | 104 |
| Make a trail mix        | 105 |
| Net a fish              | 106 |
| Make a bottle trap      | 107 |
| Using lines and bait    | 108 |
| Cook a fish             | 110 |



## FIRST AID

112

|                       |     |
|-----------------------|-----|
| First aid kit         | 114 |
| Treating a minor cut  | 115 |
| Stings and bites      | 116 |
| Sprained ankle        | 118 |
| Make a sling          | 119 |
| Dealing with sickness | 120 |
| Burns and blisters    | 121 |
| Glossary              | 124 |
| Index                 | 126 |
| Acknowledgments       | 128 |

## HOW TO USE THIS BOOK

This book is packed with outdoor activities, some simple while others are potentially hazardous.

Please always bear in mind:

- Don't deliberately put yourself in harm's way to try out the more hazardous activities, such as escape a crocodile or deal with a shark.

- Always carry out the more hazardous activities under adult supervision. Those activities have been marked with this symbol.



- Use your common sense, and do proper research and initial practice before attempting the activities for real.

- Bear in mind that any medical conditions may make activities more difficult or your condition worse – consult your doctor first.

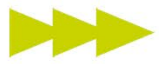
- Take care and be responsible with every activity, not just the ones marked as hazardous, to ensure you are safe.







# FOREWORD



BY COLIN TOWELL

I am often asked what is the most terrifying survival situation I have been in, but, although I have operated in some of the world's most hostile environments, I have never actually found myself in a true "life or death" survival situation. Am I just lucky? Maybe, but as they say in the military, "luck favours those who are best prepared".

While some survival situations do happen through sheer bad luck, most arise from a sequence of events that could have been avoided. When sitting on top of a mountain suffering from hypothermia, it is too late to realize that you should have either checked the weather forecast and packed warm clothing before you set out, or turned back when the weather looked like changing!

Hiking, camping, and exploring the outdoors are great fun and hugely rewarding, but remember the wise old survival saying: "knowledge weighs nothing and takes up no room in your pack". With this book, you will learn essential outdoor craft and survival techniques that will help you avoid survival situations and show you what to do if the unfortunate does happen.

A handwritten signature in black ink, reading "C. Towell". The signature is stylized with a large, looping "C" and a long, sweeping underline.



# PREPARE YOURSELF

In an age of high-tech outdoor equipment, you should not underestimate the **importance of knowledge, hands-on skills**, and the **"will to survive"**. In a true survival situation, these may be all you have! The key factor for a successful wilderness adventure is **preparation**. Make your **priorities protection, location, water, and food**.

## TIP

Understand your limits and don't attempt to go beyond what you or your gear are fit to cope with.

## PROTECTION

Protect yourself against the elements and injury:

- Prepare for changing weather conditions, such as a cold snap, and plan your kit accordingly.
- A positive attitude, together with knowledge and experience, will help you make good decisions.
- Set realistic and achievable goals.
- Don't go on an adventure to get fit – get fit to go on an adventure by stepping up your exercise routine.

## LOCATION

Survival and rescue can depend on location. When you plan your trip, ask yourself:

- Is the area I am going to dangerous?
- Will people know where to look for me?
- Will I be able to attract their attention?

## WATER

Water is life. No one can survive for more than a few days without it.

- Carry sufficient water (always more than you think).
- Have the means to filter and disinfect untreated water.
- Plan your route around water sources.
- Remember, if you are in a hot country, are unwell, or injured, having enough water will be even more important.

## FOOD

In a short-term survival situation, food will not be too important, but you must eat to stay fit and healthy.

- Start your adventure with a good meal – it's like filling up a fuel tank.
- Pack snacks and trail mix that are easy to ration out over a few days.
- Plan your food rations carefully – allow for unscheduled days on the trail.





# KIT LAYERS

9

The **gear** you carry should be grouped into **three categories**: first-line, second-line, and third-line kit. This equipment ranges from items that would be **essential** to your survival – first-line kit – to equipment that may be regarded as luxuries. If the worst happens, what you have in your daypack or pockets could be all you have to rely on.

Re-assess where your kit is stowed as conditions change throughout the day.

## FIRST-LINE KIT

This is basic survival gear to keep with you at all times: worn as clothing, clipped to a belt, or stowed in a pocket.

- Suitable clothing (including waterproofs), plus hat, gloves, and sunglasses
- Map (in waterproof cover), compass, GPS unit
- Mobile phone and spare power pack
- Watch
- Water bottle, with filtration/disinfection system
- Headtorch and spare batteries
- Pocketknife with small saw blade
- Safety whistle
- Survival tin (see pages 10–11)
- Firelighting kit (lighter/flint and steel/matches/cotton wool balls)
- Tissues/toilet paper

## SECOND-LINE KIT

Gear to keep you safe for a whole day out, this is kit you carry from your base camp in a small daypack.

- Spare set of clothes, including socks, hat, and gloves
- Bothy bag (see page 89)
- Rations for the day (+1 day extra)
- First aid kit
- Metal cup (for boiling water)
- Camping stove
- Extra water

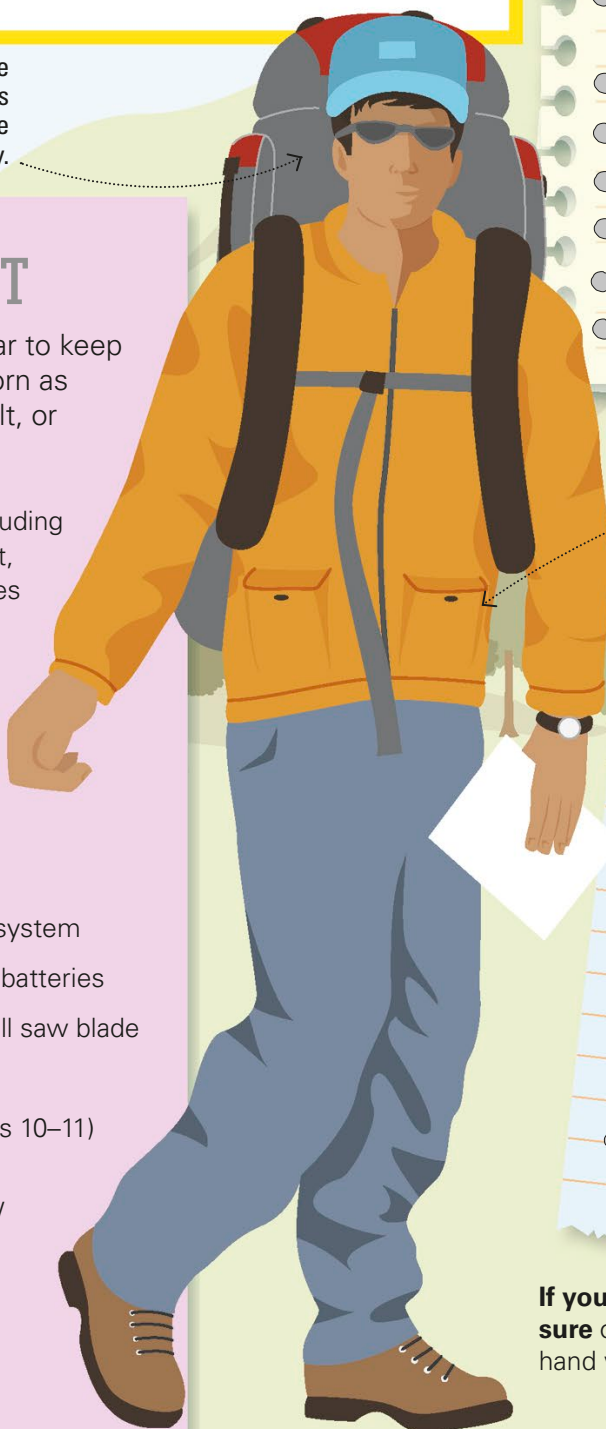
For quick access, keep essentials in a secure pocket.

## THIRD-LINE KIT

Survival equipment to keep you going for longer than just one night, third-line kit is carried in a larger backpack.

- Shelter: tent, tarp, or shelter sheet
- Sleeping system: sleeping bag and sleeping mat
- Cooking equipment: stove and cooking pots
- Wash kit and sanitary items
- Extra water
- Dry bag liner for backpack

**If you prioritize your kit, you can be sure** of having all essential items to hand whenever you need them.



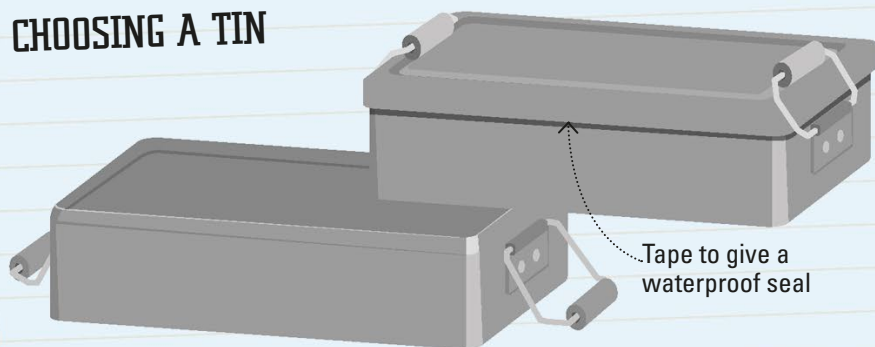


# SURVIVAL TIN

A **basic survival tin** should be **compact** enough for you to **carry at all times** and contain **useful items** that will address the immediate **priorities of survival**: protection, location, and water. Your tin is always a “work in progress” and can be adapted to suit your environment and your needs.

**AFTER AN ADVENTURE,  
REPLACE ITEMS IN YOUR  
TIN IF YOU USED THEM.**

## CHOOSING A TIN

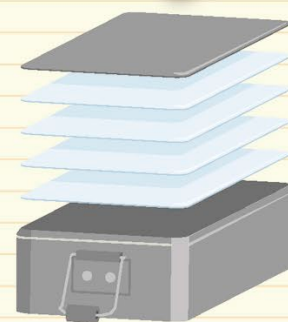


### Metal

A survival tin can be any size but should be metal so you can use it to boil water in if needed.

### Waterproof

To keep contents dry, use a waterproof tin or seal the lid to the container with electrical tape.



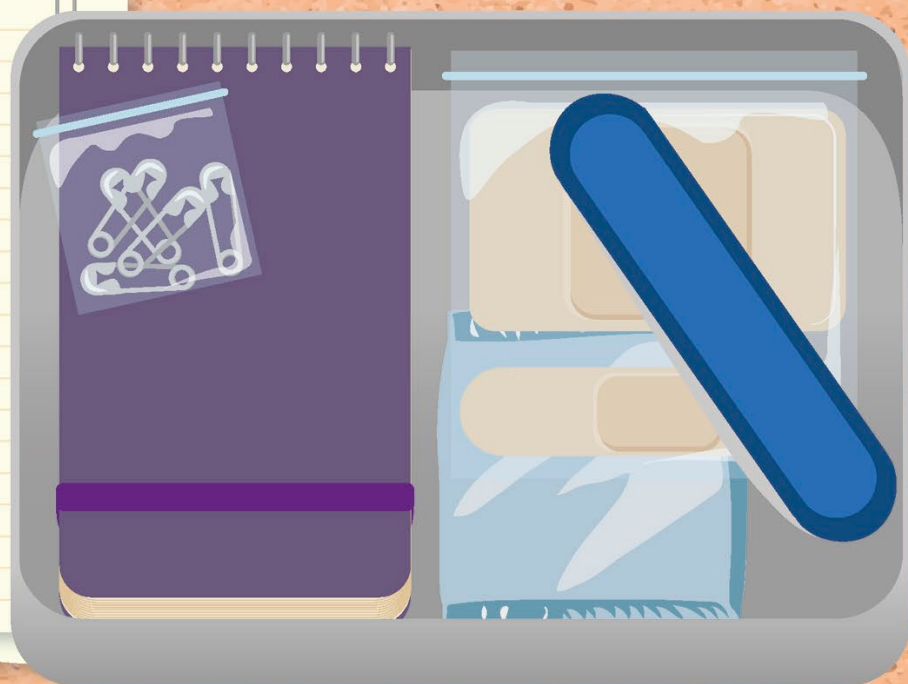
**The inside of the lid can be polished and used as a signal mirror (see page 37).**

Additional items can be taped to the inside of the lid, such as: a sailmaker's needle, safety pins, and mini glow sticks.

## PACKING THE TIN

Packing a tin is an art. Choose items carefully and add those relevant to your environment and needs. Go for quality not quantity – your life may depend on it.

A selection of items form several layers of the tin. See opposite for which items go in which layer.



## THE LAYERS OF THE TIN

11

Choose items that are “fit for purpose” and learn how to use them.

### Layer 1

Minor first aid items and water purification

- First aid items, such as waterproof plasters and adhesive suture strips
- Medical wipes
- Water purification tablets

Layer 1 (bottom layer)

- Ziplock bag of petroleum jelly
- Waterproof notepaper
- Local paper money
- Pencil or waterproof pen

Layer 2

### Layer 3

Quality essential items that have specific uses for survival

- Needle already threaded with strong cotton
- Small photon keyring torch
- Small pocketknife
- Compact compass or quality button compass

Layer 3

- Flint and steel
- Mini fishing kit with strong line
- Safety pins

Layer 4

### Layer 4

Firelighting and additional items that you figure out you need through experience

## ADDITIONAL KIT

Choose additional items that you are able to carry, and which are relevant to your needs. Here are some ideas for compact and light extra items that can be useful.



### Small candle

Once lit, a candle provides a reliable flame to help light your fire.



### Plastic bags

Bin bags can be used to keep items dry or to carry water.



### Tights

Nylon tights take up no weight or room but can be used for warmth, as a mosquito net, or improvised fishing net.



### Space/survival blanket

This thin, silver, waterproof sheet can be used as a shelter (see pages 88–89) or for an emergency signal (see page 37).



# CHAPTER 1

# NAVIGATION

GETTING LOST AND UNDERESTIMATING THE TERRAIN ARE TWO OF THE MOST COMMON REASONS WHY PEOPLE FIND THEMSELVES IN TROUBLE. A BASIC UNDERSTANDING OF HOW TO USE A MAP AND COMPASS IS KEY.

## Keeping on track

Planning an achievable and safe route before you set off will ensure that you have the knowledge to alter your route when necessary.







# HOW TO READ A MAP

A map is a flat, **graphic representation of a 3D area**. From a map, you can determine **distance and height** on the ground. If you are able to read and interpret a map, you can **visualize the terrain** you will be walking across, identifying **map features** as **landmarks** to help you navigate.

NAVIGATING IS ALL ABOUT TRUSTING YOUR MAP AND COMPASS.

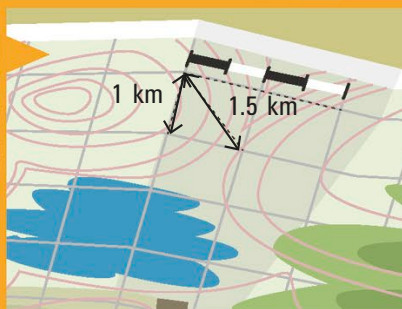
Cairn helps to identify starting point.



## STEP BY STEP



**1** Set your map (see pages 18–19). Line a pencil up between your location and a map feature. Turn the map until the pencil points to the same spot on the ground.



**2** Estimate the distance between features. On a 1:25,000 scale map, a 4 cm (1½ in) grid square represents 1 km (½ mile); each diagonal represents 1.5 km (1 mile).



**3** Alternatively, measure the distance with a piece of string, following curves in the route, then measure the length of string against the scale bar.



**6** See if the shapes of features on the map are replicated on the ground. Look out for such things as curves in the path, areas of woodland, lakes, rivers, and roads.

Hills, valleys, ridges, and spurs can be matched to contour lines on the map.

Bends in the road can be identified on the map.

The shape and type of woodland can help establish your location.



**4** Identify features on the ground, such as farm buildings and marshy areas, using the map symbols. See if they align. How close are they?



**5** Match relief – the height and shape of hills, valleys, ridges, saddles, and spurs – on the ground to contour lines on the map (see pages 16–17).

Hill alongside lake

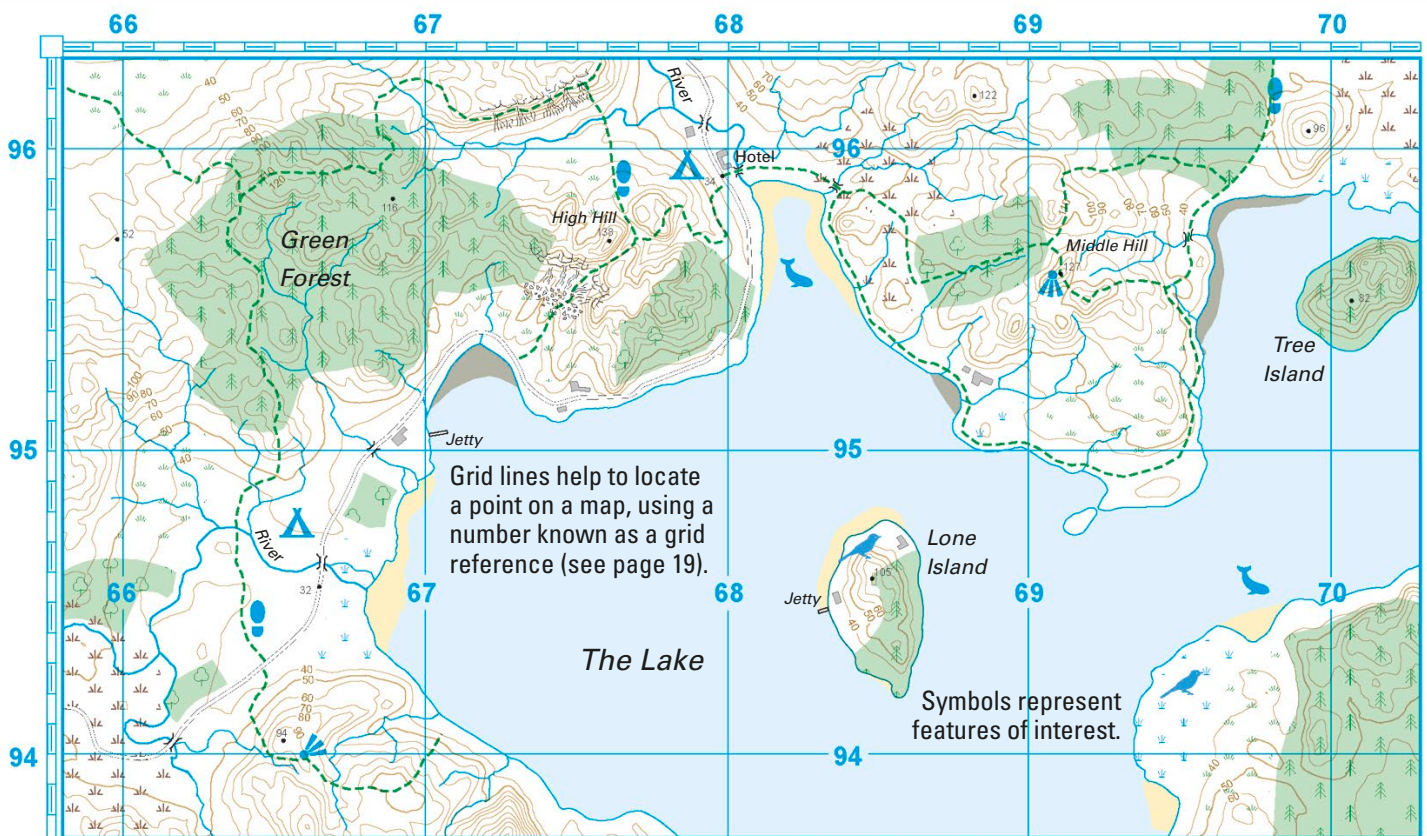
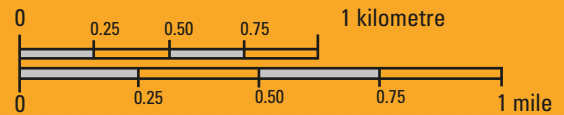


# UNDERSTANDING MAPS

**Topographic maps** are best for hiking. These show **natural and man-made features** such as rivers and paths, and depict the lie of the land with **contour lines** to represent height. They incorporate a **legend** to decipher the information shown on the map, a **grid** to help locate specific points, and a **scale bar** to indicate distance.

## SCALE

The scale is a ratio of how much you would have to enlarge the map to reach actual size. A 1:25,000 map, on which 4 cm represents 1 km (2½ in to 1 mile), is useful for hiking.



## MAP LEGEND

A legend, or key, deciphers the information shown on the map. Knowing the symbols used will help you to visualize what is being represented on the map.

### Natural features and height

|  |       |  |                     |
|--|-------|--|---------------------|
|  | Water |  | Shingle             |
|  | Mud   |  | Scree               |
|  | Sand  |  | Vertical face/cliff |

### Vegetation

|  |                      |
|--|----------------------|
|  | Coniferous trees     |
|  | Non-coniferous trees |
|  | Scrub                |
|  | Bracken/heath        |
|  | Marsh                |

### Tourist and leisure

|  |                |
|--|----------------|
|  | Fishing area   |
|  | Campsite       |
|  | Walks/trails   |
|  | Viewpoint      |
|  | Nature reserve |

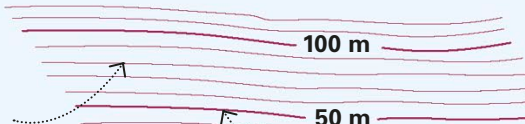


# VISUALIZING RELIEF

17

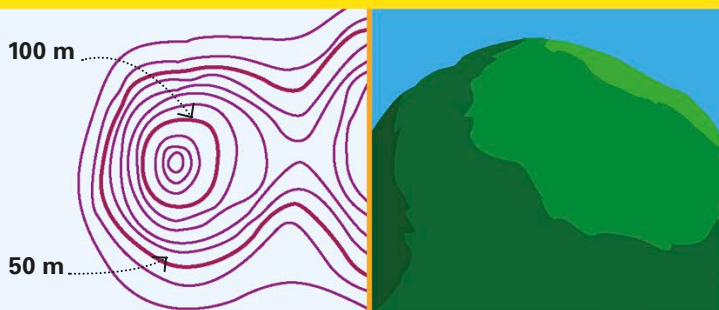
Contour lines join points of **equal height above sea level**, revealing the shape of the ground in detail. The ability to imagine how **contour lines translate to the ground** will help you to read a map. Knowing how steep the ground is will **help you plan your route**.

Each contour line represents a 5 m or 10 m height change.



**The closer together** contour lines are, the steeper the slope is.

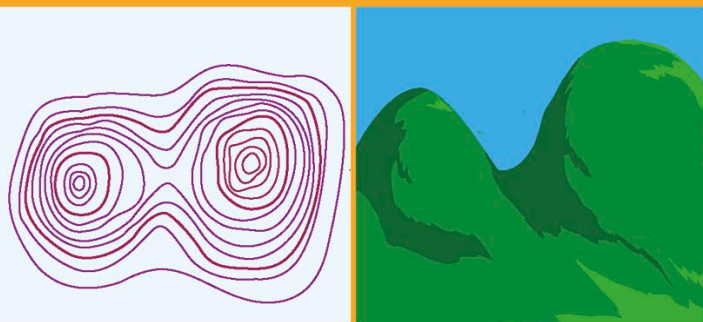
Every fifth contour line is thicker and has its height on it.



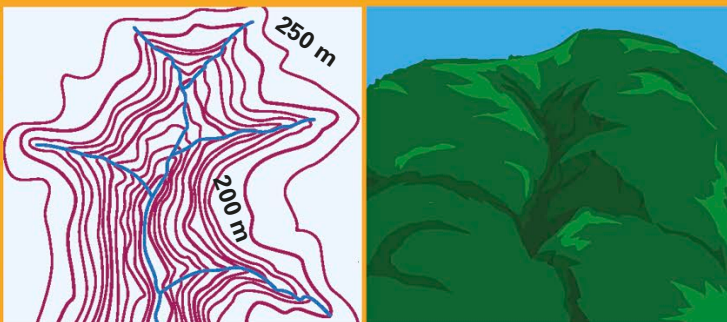
**Contour lines** run all the way around a hill in a closed ring. How close the lines are will give you an idea how steep the hill is.



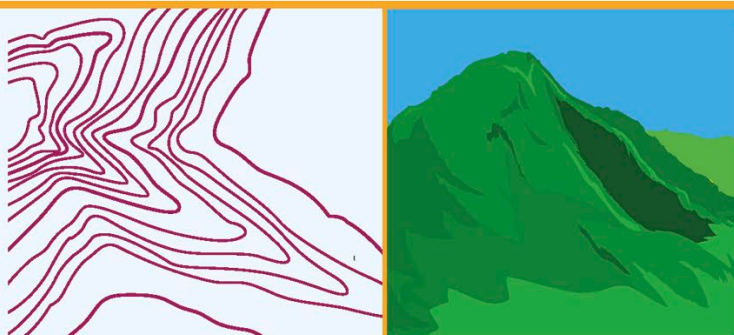
**Parallel contour lines** with high ground in the middle show a ridge. Walking up and down uses a lot of energy, so follow lines around instead.



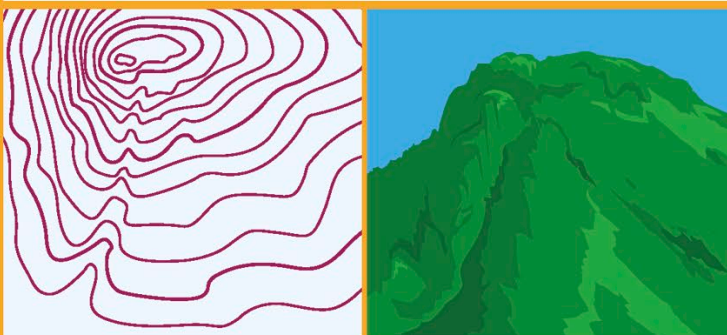
**A saddle** has two ring contour patterns with lower ground in between – like two hills joined by a ridge that dips in the middle.



**A valley** is indicated by a series of hairpin bends, with the bends pointing uphill. Check the contour numbers to work out which way a valley slopes.



**A spur**, jutting out from the side of a hill, is shown by a series of hairpin bends, with the bends pointing downhill.



**A valley that runs down a hillside**, often between spurs, can be identified as a series of contour lines that point uphill.



# USE A COMPASS

A compass has a **needle**, which is a **magnetized piece of metal**. When allowed to rotate freely, the needle will point towards **Earth's magnetic North Pole**. Use a compass to determine **direction**, orientate (line up) yourself and your map, work out **bearings**, and **navigate** from one place to another.

**ALWAYS HOLD A COMPASS LEVEL AND WAIT A FEW MOMENTS FOR IT TO SETTLE. IT WILL POINT TO MAGNETIC NORTH.**



Hole for attaching cord

Rotating dial

The number of degrees indicates the bearing.

Orienting arrow points to compass point N

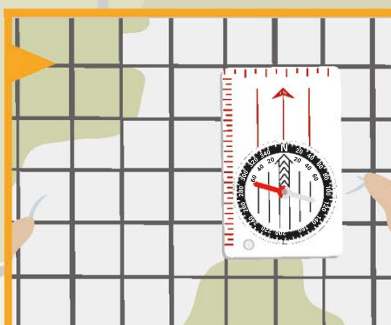
The red end of the needle always points to magnetic north. The white end points to magnetic south.

Orienting lines

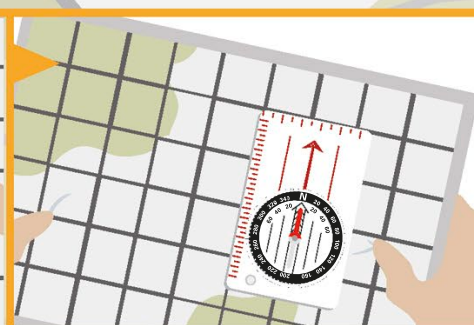


## STEP BY STEP

**1** First you need to "set your map". This means orienting the map to your surroundings. To do this, take your compass and rotate the dial so that the N on the dial lines up with the index line. The N on the dial should point towards the direction of travel arrow. Don't worry about what the needle is doing.



**2** Lay the map on the ground. Line up the long side of your compass with the vertical grid lines (eastings). The direction of travel arrow points to the top of the map.



**3** Keeping the compass aligned with the eastings, carefully rotate the entire map until the needle points to N on the dial. The map is now set to magnetic north.



## MAGNETIC VARIATION

19

Magnetic variation is the difference between magnetic north on your compass and grid north on your map (see page 21). It can be either east or west or a large or small variation depending where you are in the world.

As you advance with map and compass skills, attend a class on magnetic variation in order to understand how it applies to the area you are in. A class will teach you that:

- When you work out a route bearing on a map, you need to compensate for (add or subtract) the variation to your compass before setting off.
- The same principle applies to transferring a bearing taken on your compass and plotting it on a map.
- Over short distances, you can usually ignore the variation but for longer distances, such as over 2 km (1 mile), it should be done.

The direction of travel arrow points to the direction in which you should walk.

The index line is an extension of the direction of travel arrow.

## GRID REFERENCES

Use the grid lines on this map to describe the location of the grey square. This is a "grid reference".

Vertical lines on a map are called "eastings".

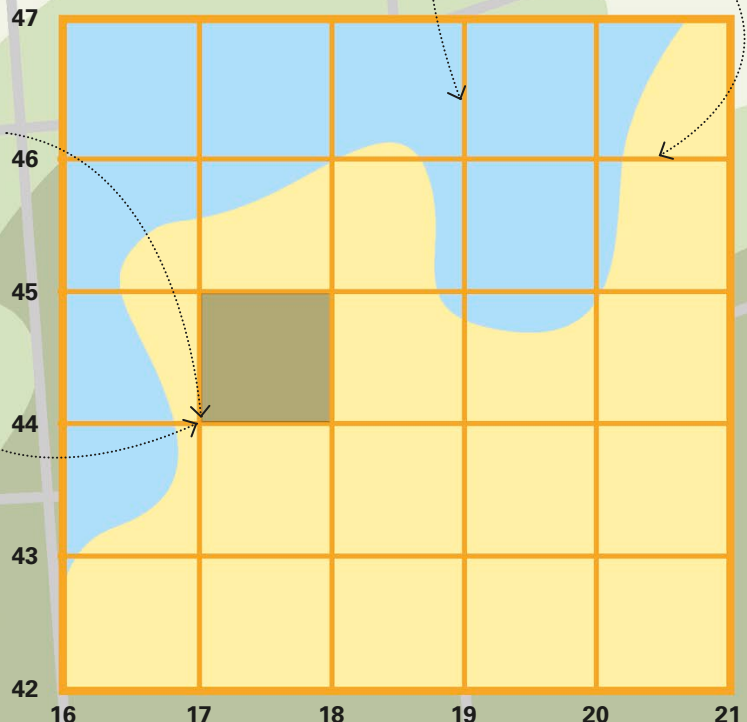
Horizontal lines are called "northings".

**1** Give the number of the easting at the bottom left-hand corner of the square.

**2** Then give the number of the northing in that corner.

**3** The grid reference for this square is 1744.

**4** You now know that the top of the map is pointing to magnetic north. Features on the map should more or less line up with those that you can see around you.





# NAVIGATE WITH A COMPASS

When out hiking, you need to know where you are, so you **do not get lost**. Also, if you do have an emergency, you need to be able to let others know exactly where you are. **Use a compass and map** to work out which direction to take to reach your destination. Map reading and compass navigation are **great skills** to have. It's fun to practise them whenever you are hiking.

**DON'T RUSH YOUR COMPASS WORK. ERRORS COULD GET YOU LOST.**

Can you see your destination? Use your eyes as well as the compass.

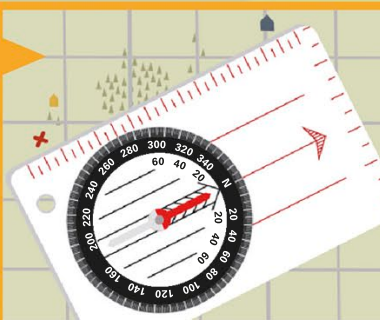
Trees or other features of the terrain may block the view of your destination.

Keep an eye on obvious landmarks to help you work out where you are.

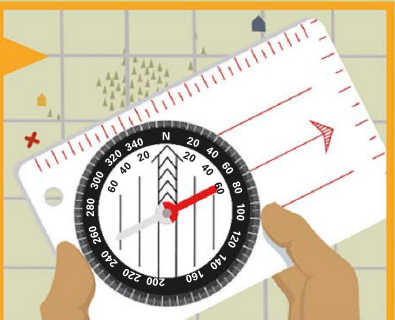
## STEP BY STEP



**1** Lay your map on flat, dry ground. Make sure there is nothing metal nearby, such as a zip or mobile phone. These could interfere with the magnetic compass.



**2** Lay the edge of the compass so that it runs between where you are and where you want to go. The direction of travel arrow points to your destination.

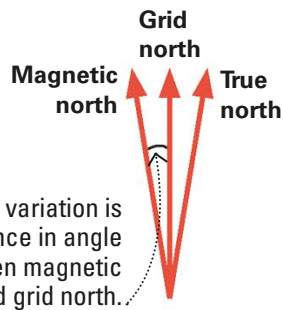


**3** Turn the compass dial until the orienting lines align with the vertical eastings on the map. The orienting arrow will point to the top of the map. Ignore the needle.



## THREE DIFFERENT NORTHS

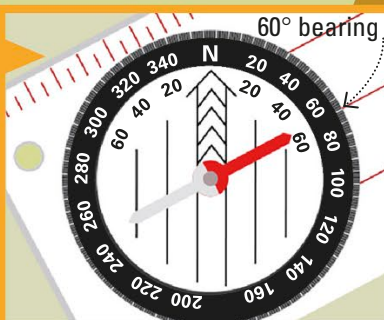
Some map legends indicate three types of north. "True north" is the direction of a line of longitude that wraps around the globe towards the North Pole. "Grid north" runs parallel to the vertical grid lines on a map and differs from true north because a map is flat. A compass needle points to "magnetic north".



**6** Set off, following the direction-of-travel arrow, not the needle. Every now and then, check you are still heading in the right direction by turning your body until the compass needle lines up with the orienting arrow.

Hold the compass in front of you at chest height, so you can look down at it easily.

If the compass dial gets knocked out of place, turn it so that the correct bearing lines up with the index line.



**4** On the dial, read the number (in degrees) that lines up with the index line. This is the direction-of-travel bearing. Remember it, as the dial may shift as you walk.



**5** Holding the compass flat, turn around until the needle sits inside the orienting arrow, pointing to N on the dial. Now the direction of travel arrow points to your destination.

# FIND NORTH BY DAY

If you don't have a **compass**, or it has been lost or broken, you can use the **Sun** to work out an approximate direction. The Sun rises due east and sets due west, and will be due south at midday in the northern hemisphere and due north in the southern hemisphere. This simple way of direction-finding uses a **shadow cast** by the Sun.

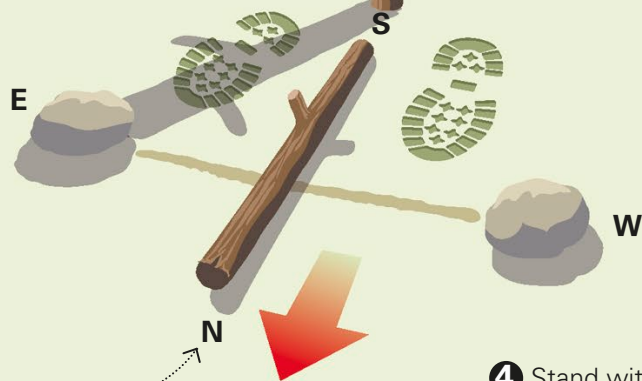
**THE SHADOW METHOD WORKS AT NIGHT IF THE MOON IS FULL.**

In the southern hemisphere, the north-south direction is reversed and this point will be south.

The Sun moves 15° an hour from east to west over the course of a day.

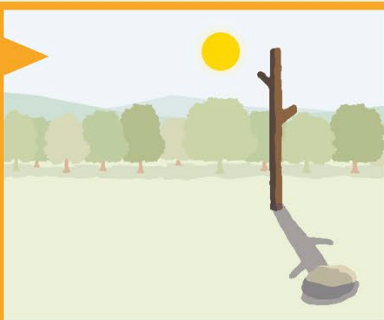
Choose an area of flat ground clear of debris, ideally in an open space not overshadowed by trees.

An upright stick about 1 m (3 ft) tall works well for this technique.

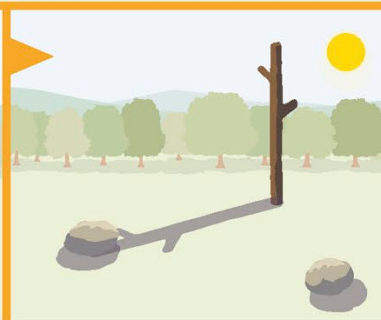


**4** Stand with your back to the upright stick and your feet at either side of the stick on the ground. You are facing north.

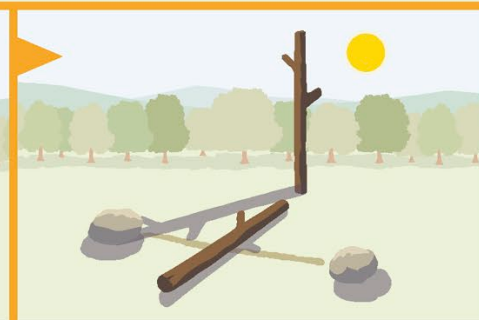
## STEP BY STEP



**1** Plant your stick and place a stone on the tip of its shadow. (For greater accuracy, do this an even number of hours before and after midday.)



**2** As the Sun moves, so the shadow will move. Wait at least four hours and then place a second stone at the tip of the repositioned shadow.



**3** Mark a line between the stones. Lay a straight stick over its centre to form a cross that marks approximately north-south, east-west.



# FIND NORTH BY NIGHT

23

The **Moon** takes about 28 days to complete an orbit around Earth. During this orbit, it appears to **change shape** in the night sky. When the moon looks like a **crescent**, you can use it to find an approximate **south** on the horizon in the northern hemisphere, and an approximate **north** in the southern hemisphere. The method is not completely accurate, but it can be helpful.

The imaginary line points south in the northern hemisphere and north in the southern hemisphere.

**2** Place a stick on the ground that points to where the imaginary line touches the horizon. The stick lies roughly north to south, so you can now find east and west.

**1** When the Moon appears as a crescent, draw an imaginary line (or hold up a stick) between the points, or "horns", of the crescent. Extend the imaginary line to the horizon.



## THE LUNAR CYCLE

As the Sun sets, the Moon rises with the side that fully faces Earth lit up by sunlight. In its orbit around Earth, the Moon passes through "phases" in which

different parts of it are illuminated by the Sun. These phases follow a regular pattern called the lunar cycle.



New Moon



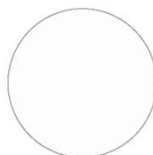
Waxing crescent



1st quarter half



Waxing gibbous



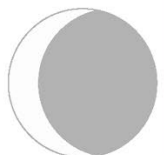
Full Moon



Waning gibbous



Last quarter half



Waning crescent

# FIND NORTH BY THE STARS

If you are in the **northern hemisphere**, look up to spot **the Plough** in the night sky. This saucepan-shaped **constellation** can be used to find the North Star, **Polaris**, shining above the North Pole. The stars rotate as Earth spins, but Polaris does not appear to move. For centuries, travellers have used it as a **guiding star**.

ON CLEAR NIGHTS, POLARIS IS SEEN FROM SUNSET TO SUNRISE.

**1** Locate the Plough. Its outline looks like a saucepan. The two stars that form the front of the "pan" are called the pointers.

**2** Connect the pointer stars with an imaginary line. Extend this line for about four times its length to find Polaris.

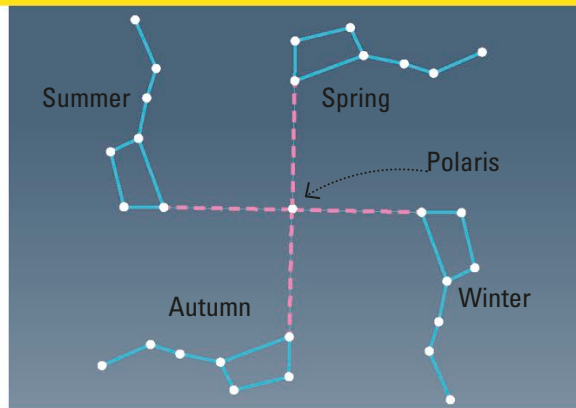
This star and the one below are the pointers.

**3** Drop a vertical line down from Polaris to the horizon. This point is approximately north. You can now work out the other points of the compass.



## THE PLOUGH YEAR ROUND

The Plough, sometimes also known as the Big Dipper, is made up of seven stars. Due to Earth's movement, this group of stars changes its position in the sky throughout the night and throughout the year.





# FIND SOUTH BY THE STARS

25

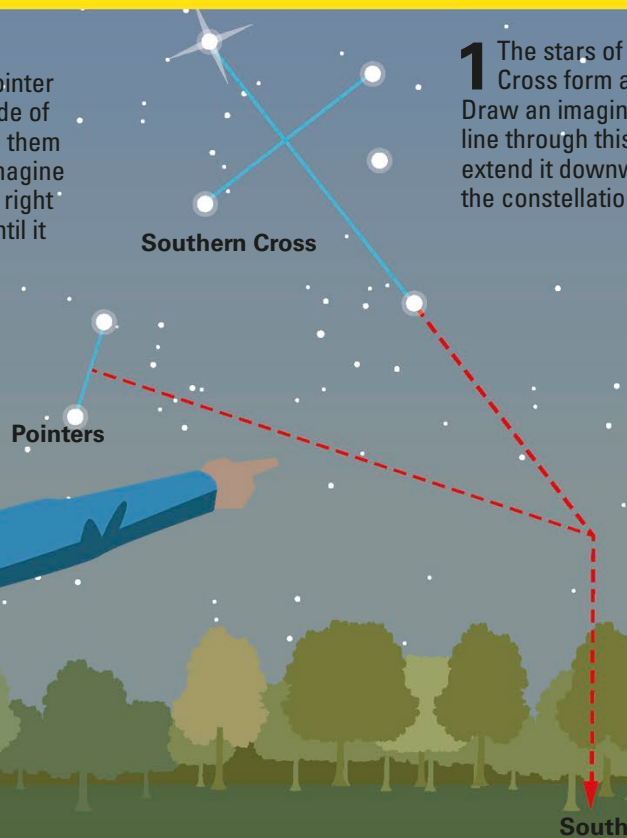
Finding **south** in the **southern hemisphere** is not quite as easy as finding north in the northern hemisphere, but it can be done. You need to locate the four main stars of the **Southern Cross constellation** and the bright stars known as the **pointers** as guides.

**PRACTISE LOCATING THE POSITION OF THE STARS THROUGHOUT THE YEAR.**

**2** Find the two bright pointer stars that lie to the side of the constellation and join them with an imaginary line. Imagine another line extending at right angles from the centre until it crosses the line from the Southern Cross.

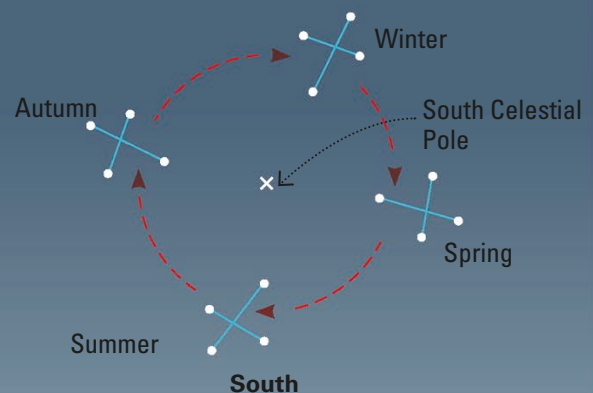
**1** The stars of the Southern Cross form a kite shape. Draw an imaginary diagonal line through this shape and extend it downwards from the constellation.

**3** The point where the two lines cross is the South Celestial Pole. Drop a vertical line to the horizon to locate approximate south.



## THE SOUTHERN CROSS YEAR ROUND

The Southern Cross and the pointer stars rotate clockwise around the South Celestial Pole throughout the year. They hold the same positions in relation to each other, no matter how they are oriented in the sky.



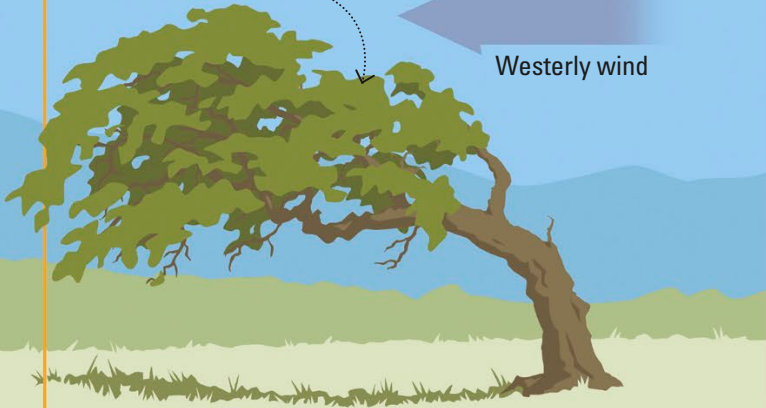
# NATURE'S OWN SIGNPOSTS

If you don't have a compass, and can't see the sun, you can **turn to nature** to get an idea of **directions**. Knowing the prevailing **wind direction**, or whether major **roads, rivers, or railways** run in particular directions, can also help you figure out where you are and where to go.

The side facing the sun has denser foliage and, depending on species and season, more buds, flowers, fruits, or nuts.

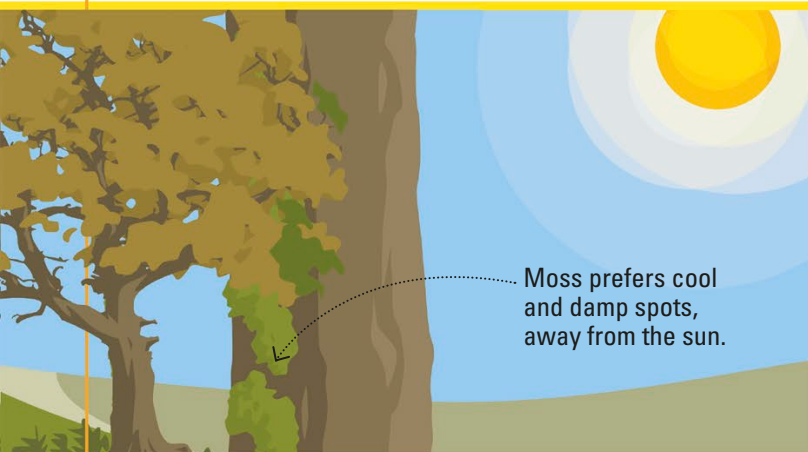
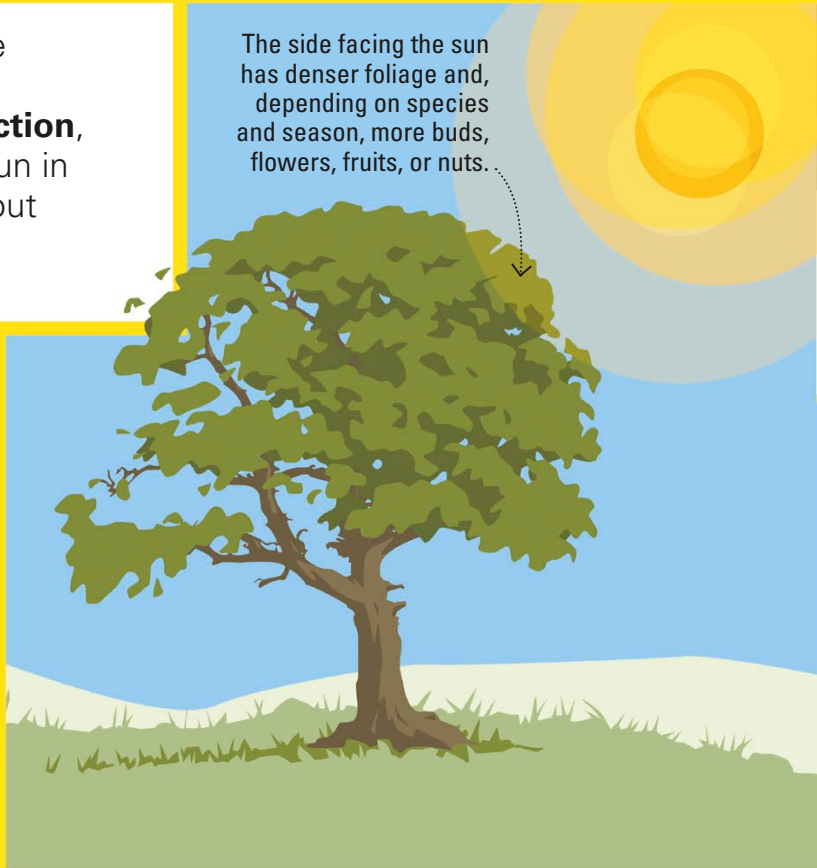
Tree bent towards the east

Westerly wind



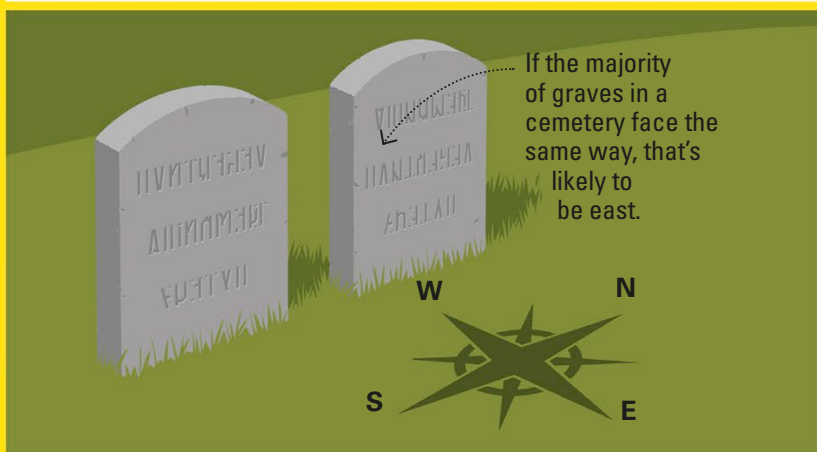
**Over the years, trees in windswept areas grow** bending away from the wind. So, if the prevailing wind in an area is westerly, tree shapes will be pointing towards the east.

**Tree growth is the most lush on the side that faces the sun.** Remember that this means south in the Northern Hemisphere, but if you are in the Southern Hemisphere it means north.



Moss prefers cool and damp spots, away from the sun.

**Moss and most lichens grow** on the shady sides of objects, out of direct sunlight. So, they grow on the north side in the northern hemisphere and on the south side in the Southern Hemisphere.



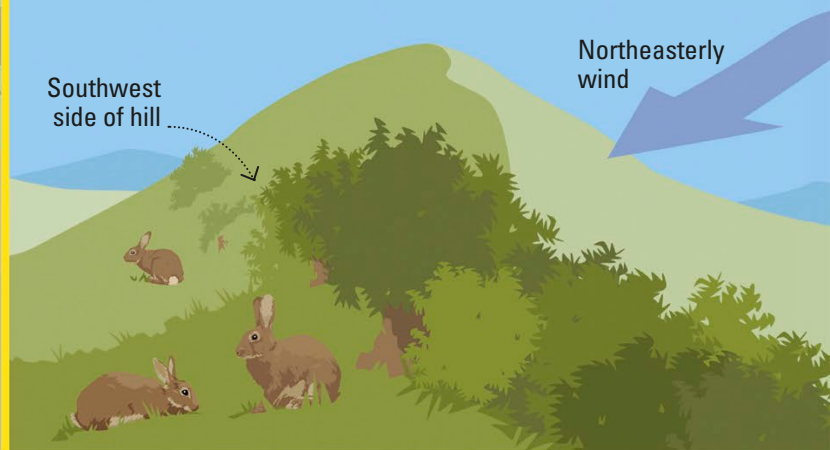
If the majority of graves in a cemetery face the same way, that's likely to be east.

**In many Western cultures, gravestones traditionally** face the rising sun. This practice is no longer always followed, so look for older graves, and compare with natural signs to make sure.

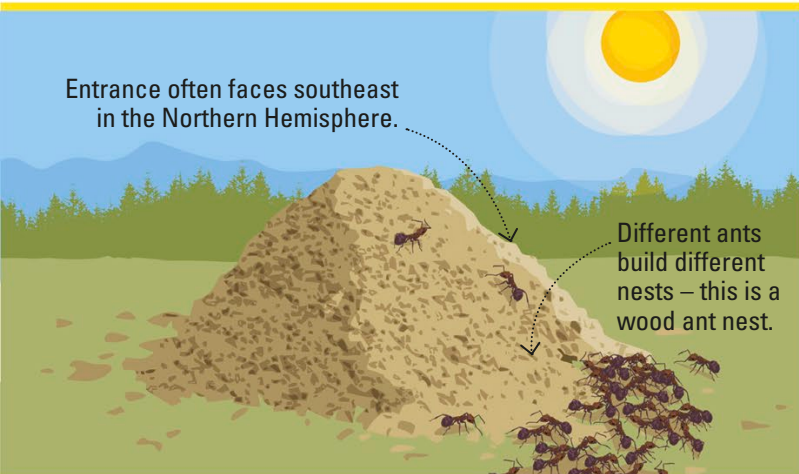




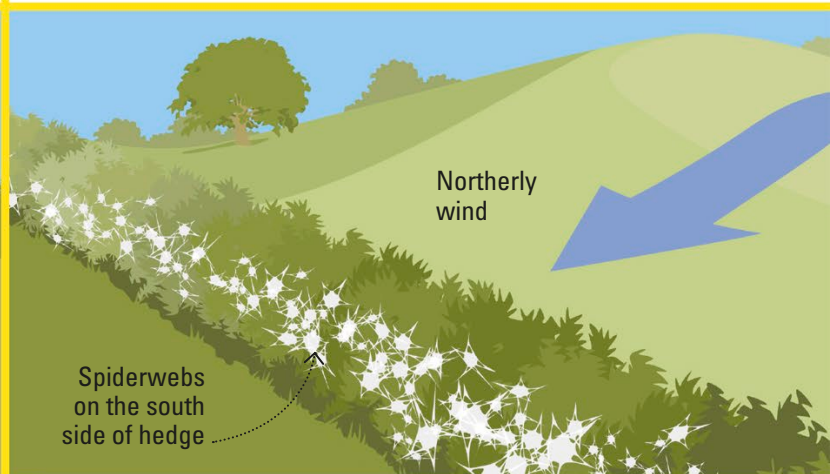
**In very windy areas, where the wind direction is constant,** birds tend to nest on the leeward side of hills to be more sheltered. To read this sign correctly, you need to know the prevailing wind in the area.



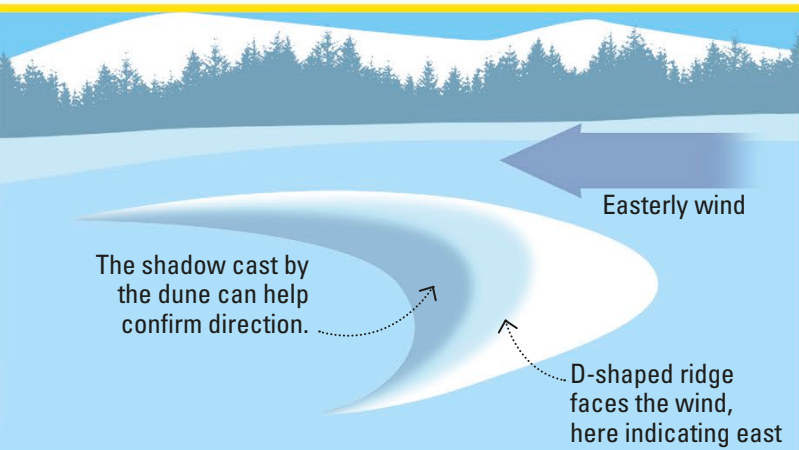
**Small animals burrow on the leeward side of windswept hills.** If you know the prevailing wind direction, look out for rabbit holes, or other small dens, for an idea of the direction the slope faces.



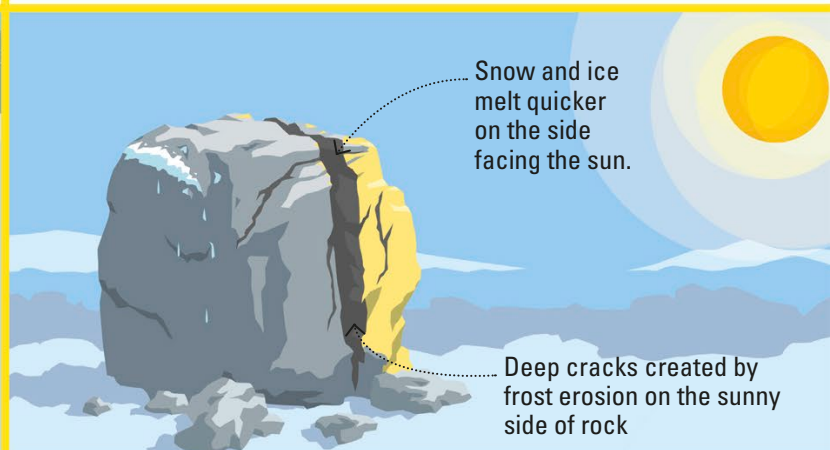
**Many anthills use the sun to regulate their inside temperature,** and tend to face towards it to catch as much sunlight as possible. This is not always the case, so use along with other signs.



**Spiders usually spin their webs in the sheltered side of trees, buildings, hedges, and fences,** so the wind doesn't break or destroy their webs – so you need to know the prevailing winds.



**If you know the prevailing wind, observing the shape of snow dunes can help you determine direction.** Prevailing winds form D-shaped dunes with the curve of the D pointing into the wind.



**Frost erosion,** happens when water repeatedly freezes and thaws on rocks and bare mountain sides. It usually creates the most severe vertical cracks on the part facing the sun.

# USING GPS TECHNOLOGY

A **Global Positioning System** (GPS) is a handheld device that uses signals from a group of **24 orbiting satellites** in space to work out exact locations on Earth. A GPS is useful for working out straight line **distances and bearings** to and from a point, but unless it incorporates **mapping**, it will not show the best way to get there. A GPS device can be used to play an outdoor treasure-hunting game known as **geocaching**.

## GEOCACHING

Use your GPS device to navigate to a specific set of GPS coordinates, then try to find a hidden geocache (container).

## STEP BY STEP



**1** Register with a cache listing site. Search for caches near you and choose one that interests you. Record any notes or hints on a notepad.

**2** Create a route on your GPS device, using the coordinates on the cache listing site. Follow the arrow on the screen to navigate to the cache.



**3** Once located, sign the logbook in the container and return it to its original location. If you take an item from the cache, replace it with an item of equal or greater value.

Menus and features vary, so practise using your GPS device before you travel.

The receiver locks onto at least four satellites to obtain the exact location, displayed as a grid reference.

The screen lights up for use in gloomy conditions.

Durable, waterproof case





## SMARTPHONE

Inbuilt GPS systems in smartphones aid navigation, but they are not always as accurate as specialized GPS devices.

Provides access to lots of apps, including ones used for geocaching.

Battery life will reduce faster while GPS is being used.

29



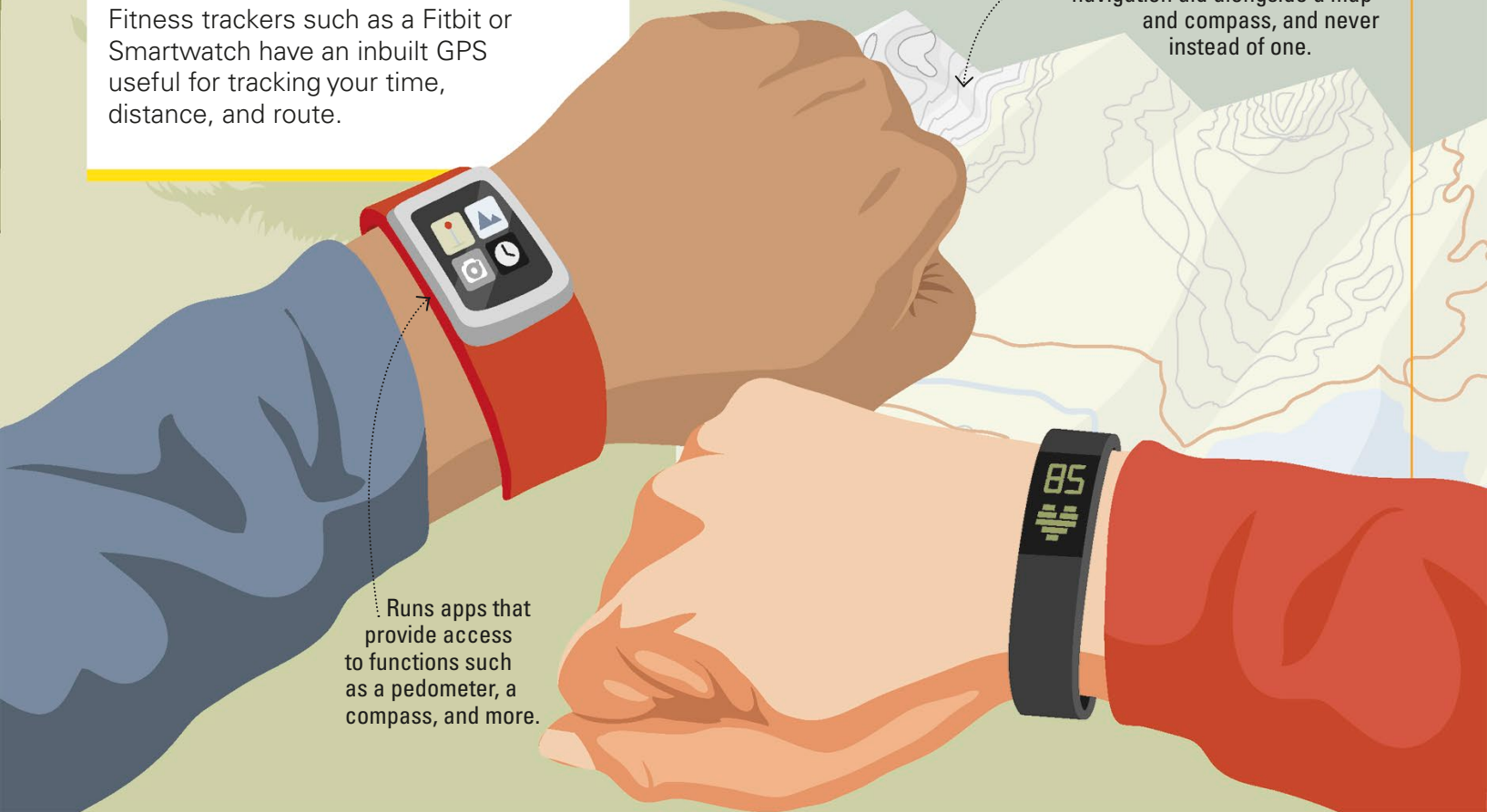
Works out its location on Earth by measuring how far it is from several satellites in space, or from cell towers.

## FITNESS TRACKER

Fitness trackers such as a Fitbit or Smartwatch have an inbuilt GPS useful for tracking your time, distance, and route.

Always use any technological navigation aid alongside a map and compass, and never instead of one.

Runs apps that provide access to functions such as a pedometer, a compass, and more.



# LEAVE AN ACTION PLAN

Even the best-planned hikes can run into difficulties, so it is essential that others know **where you are and what you are doing**. An action plan provides important information for potential rescuers, so that they have the **best chance of finding you** and your group – and looking after you when they do. Always tell someone where you are going and when you expect to return.

Supply contact details for you and your family. Include your full name and any nickname.

**CREATE A PLAN ON A PHONE APP TO ALERT FAMILY AND FRIENDS.**

Sketch your route, or photocopy or photograph a map. Add timings for points along the way.



## STEP BY STEP



**1** Provide the names, ages, height, and weight of all members of your group. List mobile phone numbers and detail any communication devices, such as radios.



**2** Give details of health issues, injuries, or allergies among your group. Write down the medication that anyone is taking or carrying. Note any first aid supplies.



**3** Detail your kit – and level of experience – so rescuers can try to understand how you will cope with certain weather conditions or an unexpected night out.



Note any animals you have with you.

Attach a photo of your hiking party to show rescuers who they are searching for and what colours of clothing and equipment to look out for. Bright colours are best!

Provide the numbers of anyone who could help in an emergency. In the UK, mountain rescue services can be reached on 999.

Text a friend your shoe size and a photo of the soles of your hiking boots – so your footprints can be tracked.

Give contact details for your campsite or hostel.

#### Park Ranger's Office:

0123 456 789

Rashmi Nath,  
local mountain guide:

0456 789 101

From 6th to 9th August,  
we are staying at  
Lakeview Campsite,  
121 Lakeview Drive.

Manager: Ben Thomas

Mobile: 0789 101 112

**4** Describe your trip, noting departure, arrival, and rest locations. Provide a sketch or a map with grid references or GPS coordinates. Note any hazards or alternative routes.

**5** Give the date and time you aim to set off and return. Make sure someone knows to raise the alarm if you do not return by a certain time.

**6** When you've finished your plan, give copies to your family, the managers of your campsite or hostel, and any park rangers. Text or email copies of the plan as a back up.

# WHAT TO DO WHEN LOST

If you **plan a route** and stick to it, you are less likely to get lost. **Pack water, food, and the right clothing.** Safety equipment should include a mobile phone, torch, shelter sheet, and first aid and fire-starting kits. If you do become lost, **stop immediately, stay calm,** and make a plan.

**SPLIT YOUR TREK INTO SECTIONS - EVERY 1 KM (½ MILE), CHECK YOUR COMPASS AND MAP.**



Check the map to try to work out where you went wrong. Go back to your last known position – but only if you are sure you know the way.

Travis 5pm 18/7  
Heading north  
to main road

Use sticks to make an arrow, showing the direction you are heading.

If you have to move, leave signs and notes to let people know when you were there and in which direction you have gone.

## STEP BY STEP



**1** Assess the situation. Are you in immediate danger, by a steep drop, for example? If yes, move to safety. If you have a GPS, or phone with GPS, try to work out where you are and get back on track.

**2** Assess your surroundings. Climb to higher ground to have a good look around. If you can see a house, road, or recognizable feature, safely make your way there. Then call someone to let them know where they can collect you.



Check the sky – if rain seems likely or it's getting dark, look for shelter.

SHELTERS - SEE PAGES 84-87

Trees provide shelter and firewood.

You will be easier to spot in open ground, and so will location signals. Tie a brightly coloured rag or a strip of rubbish to a bush if you can.



**3** If you can't work out where to go to be safe, stay put and call for help. You'll get better mobile reception from high, open ground. Plan to make signals (see pages 34–37).



**4** Assess your supplies. Consider rationing food and water in case you need them to last longer. Water is the most important requirement for survival – is there a source of drinking water nearby?



**5** If needed, find or construct a shelter to keep you out of the wind, rain, and cold (see pages 84–87). You'll need to leave your shelter from time to time to remain visible and make location signals.

# CALL FOR HELP

The best way to call for help is with a **mobile** phone. If you don't have one (or there is no reception), you can make **distress signals** with a whistle, a flashlight, or a glow stick. Whatever you use, you need to do three things: **attract attention**, **hold attention**, and **direct rescuers** to your location.

**CARRY A SPARE POWER PACK TO RECHARGE YOUR MOBILE PHONE.**

Wave your arms to attract attention, but don't shine a torch directly at the pilot.

Rescue helicopters fly past quickly. Keep signalling until you know the crew have seen you.

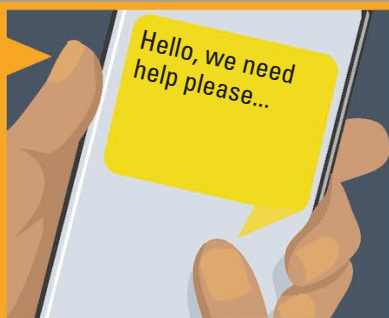
Mark your location with coloured clothing. Pick this up before the helicopter lands, as loose items can become hazards.



Mark your location with coloured clothing. Pick this up before the helicopter lands, as loose items can become hazards.



## STEP BY STEP



**1** Find open ground where signals can be seen easily. Mobile phone signals may be good enough here to send a text, even if you can't make a call.



**2** Hold the attention of rescuers by keeping up your signals until they've been seen. If you're using a mobile, explain what help you need.



**3** Direct your rescuers by sending them a description of the area and any landmarks you see. If your phone has a camera, send photos.



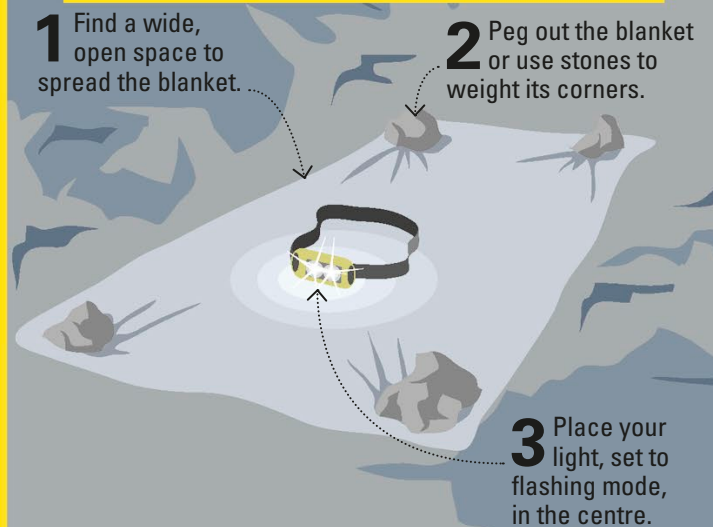
## WHISTLE AND TORCH

Keep a whistle on a cord round your neck. Use this, or a light, to make the International Emergency Signal.



## REFLECTED SIGNAL

Placing a torch on a reflective silver survival blanket will make the light more noticeable.



## CATHERINE WHEEL

Create a bright "Catherine wheel" with a chemical glow stick. This can be seen 3 km (2 miles) or more away.



# BUILD A SIGNAL FIRE

Imagine you are lost and **you need to call for help**, but your phone is out of battery, or your backpack, with your emergency equipment inside, has been washed away. Don't panic. **A fire is an effective way of signalling** – clouds of white smoke are visible by day, and flames can be seen at night. A signal fire requires materials and hard work.

**FOR WHITE SMOKE, USE GREEN VEGETATION. AT NIGHT, USE DRY WOOD FOR FLAMES AND LIGHT.**

FIRE - SEE PAGES 94-97

The inside of the dome burns to produce smoke. The dome also shelters the fire to stop it going out.

Build your fire on flat ground in the open, so it can be seen easily.

Use tent pegs or strong, hooked sticks to peg poles into place.

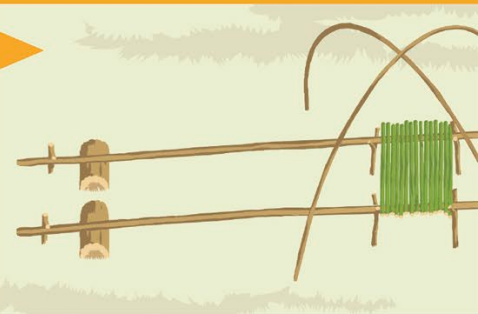
## STEP BY STEP



**1** Lay two long poles parallel to each other. Prop up the ends on rocks or logs, and peg the ends down. Use four hooked stakes to support the poles.



**2** Lay green wood sticks in between the hooked stakes to form a platform. The upright ends of the stakes will hold the platform in place.



**3** Bend two long saplings to criss-cross over the platform. To secure the saplings firmly in place, dig their ends into the ground, like tent pegs.



Green foliage, fur boughs, and leaves create lots of white smoke.

## SIGNAL MIRROR



Polish the end of a drink can with charcoal and water, toothpaste, or even chocolate. Hold the polished base up to face the sun. Do not look directly at the sun, which can damage your eyes. Reflect light onto your hand, then move your hand up and down to flash signals. A mirror, the shiny surface of a survival tin, or the inside of a crisp packet can be used instead of a drink can.

Keep a supply of dry, green vegetation nearby to feed the fire.

Never leave the fire unattended, stay away from smoke, and don't get too close to the fire.

The raised fire allows airflow, making it easier to light and to draw in oxygen.

**4** On the platform, lay materials for a large fire – tinder, kindling, and fuel (see pages 96–97). Top it off with green vegetation. Don't light the fire just yet.

**5** Add several layers of green vegetation to form a domed roof. Leave a small opening so that you can access the fire to light it and maintain it.

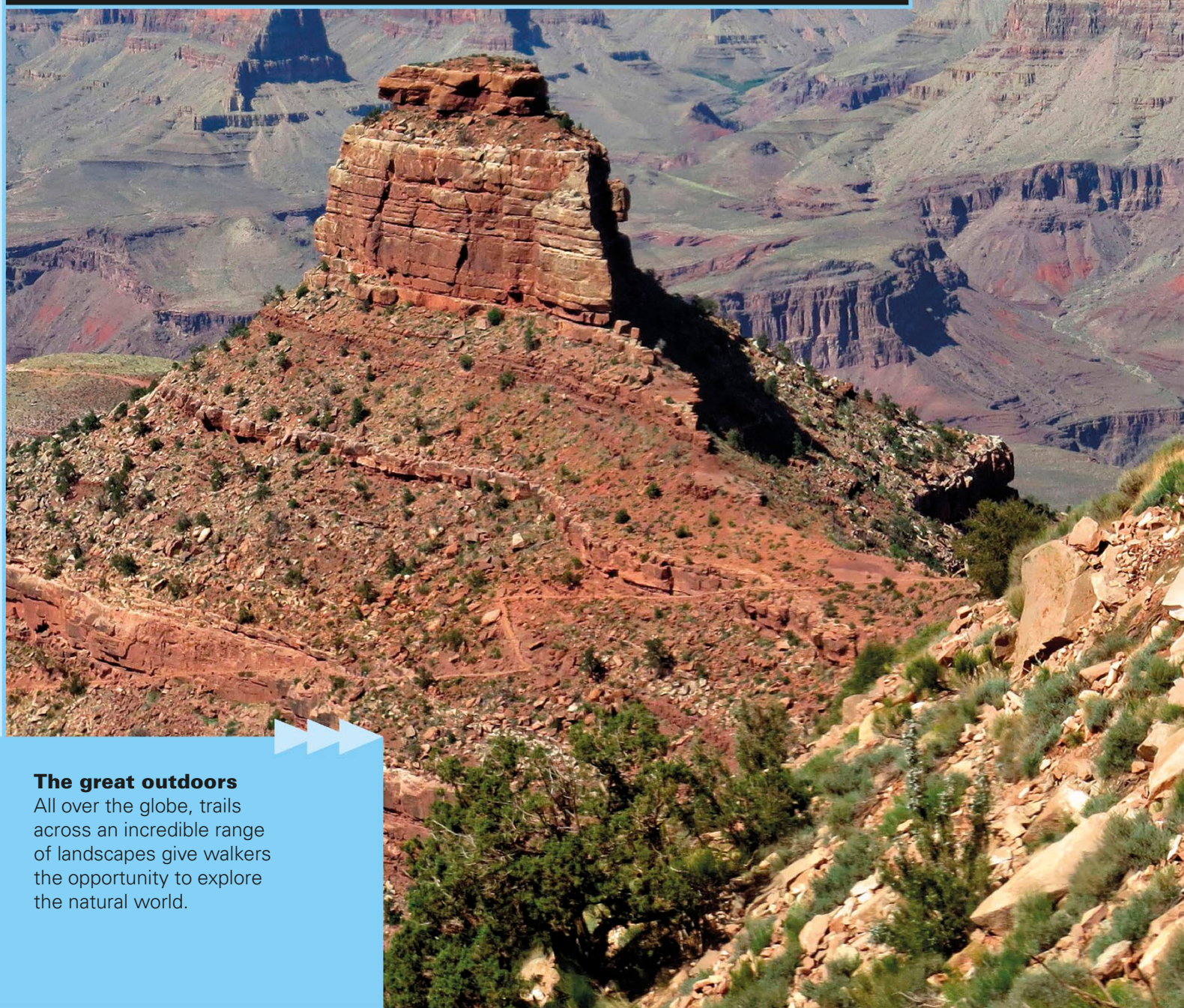
**6** Use your lighter, or flint and steel, to light the fire. If you think rescuers are coming, wait until you hear them before starting the fire. Remember, it can take a couple of minutes for smoke to be generated.



## CHAPTER 2

# ON THE TRAIL

UNDERSTANDING THE DANGERS POSED BY AN ENVIRONMENT, ITS CLIMATIC CONDITIONS, BOTH DAY AND NIGHT, AND BY THE ANIMALS THAT LIVE IN IT WILL HELP YOU PLAN A SAFE TRIP.



### **The great outdoors**

All over the globe, trails across an incredible range of landscapes give walkers the opportunity to explore the natural world.







# TRAVELLING ON FOOT

Hiking is a great way to **explore the countryside**. Before you set off, **find out as much as you can about the ground** you are going to cross and **how best to travel safely over it**. Knowing the right technique for walking down a steep hillside, for example, could help you to avoid a slip and possible injury. Your preparations should include choosing suitable equipment and clothing, too.

**NEVER HIKE ALONE. HIKING WITH OTHERS IS SAFER AND MORE FUN.**



Singing as you walk can help to keep up morale.

Take turns leading.

Swing your legs forward from the hips.

Use trekking poles or a staff for support as you ascend.

## HIKING SKILLS

If you use the right techniques, you will move more efficiently, get less tired, and enjoy your trip to the full.

**1** When walking uphill, lean forwards slightly. Keep a good pace, but take shorter strides.

Land each foot flat on the ground to increase upward push with the next step.

**2** If you are walking with other people, aim for a steady, even pace that everyone is comfortable with. Getting into a rhythm will help you all to stride along.





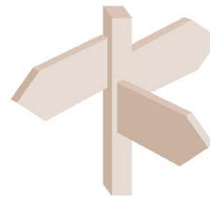
## TRAIL MARKERS

While you should always rely first on your map and compass to make sure you are on the right route, it is also helpful to keep an eye out for trail markers. These marks or signs, known as blazes, come in various forms.



### Rocks

Blazes painted on rocks, boulders, and trees are common. They may be low down – look carefully around you.



### Signposts

Made from wood, metal, or plastic, these are especially useful when there are few rocks or trees to mark.



### Cairns

Piles of rocks, known as cairns, are fairly easy markers to spot in bad weather. Some are small rock piles, others are large stacks of boulders.



### Directional signs

Look out for painted arrows or variations such as a bend in the blazes. These warn you of a change of direction in the trail.

**3** Break down the route into sections. Stop regularly to let everyone see where they are on the map, and tell them how far it is to the next break.



A short rest now and then to drink water and eat a handful of trail mix will keep you going.

Use your arms for balance.

Relax at the hips.

Zigzagging downhill places less strain on your thighs, knees, and ankles.

Keep your knees bent.

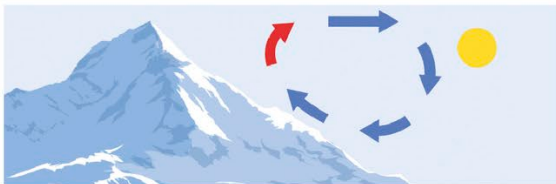
**4** Walking downhill places a lot of strain on your thighs, knees, and ankles, especially if you are carrying a heavy backpack. Keep the pace steady. Use your staff as a brake to stop yourself going too fast.

Looking at the **clouds** can help you to **read the weather** when you are on the move, with no access to forecasts. Knowing how to **recognize a storm cloud** will give you warning to **seek shelter** or **put on rainproof layers**. If low cloud impairs visibility, trust your compass to navigate.

**BAD WEATHER AND THE WRONG CLOTHING CAN BE FATAL - NEVER BE AFRAID TO TURN BACK.**

## KNOWING THE WINDS

Weather is affected by local geography – factors such as high ground forcing air to rise and cool and the different temperatures of land and sea.



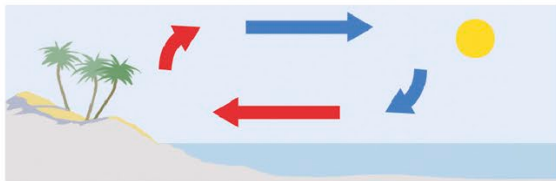
### Upslope winds

During the day, mountain slopes heat up. Air rises and creates a gentle upslope breeze.



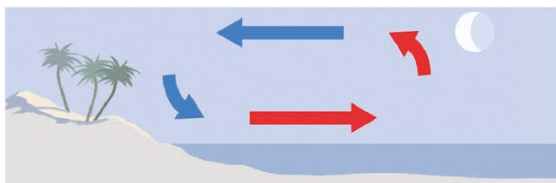
### Downslope winds

On clear nights, air in contact with ground cools, its density increases, and it flows down a slope.



### Sea breeze – from sea to land

Warm air rises over land as it heats up during the day, drawing in cool air from the sea to replace it.



### Land breeze – from land to sea

At night, land cools faster than sea. As warm sea air rises, air is drawn from the land to replace it.

### High clouds

If there are no clouds, expect good conditions. High, white clouds usually indicate fair weather, but spreading blankets of high cloud can signify bad weather on the way.

Tall, anvil-shaped cumulonimbus clouds are associated with thunderstorms and heavy rain.

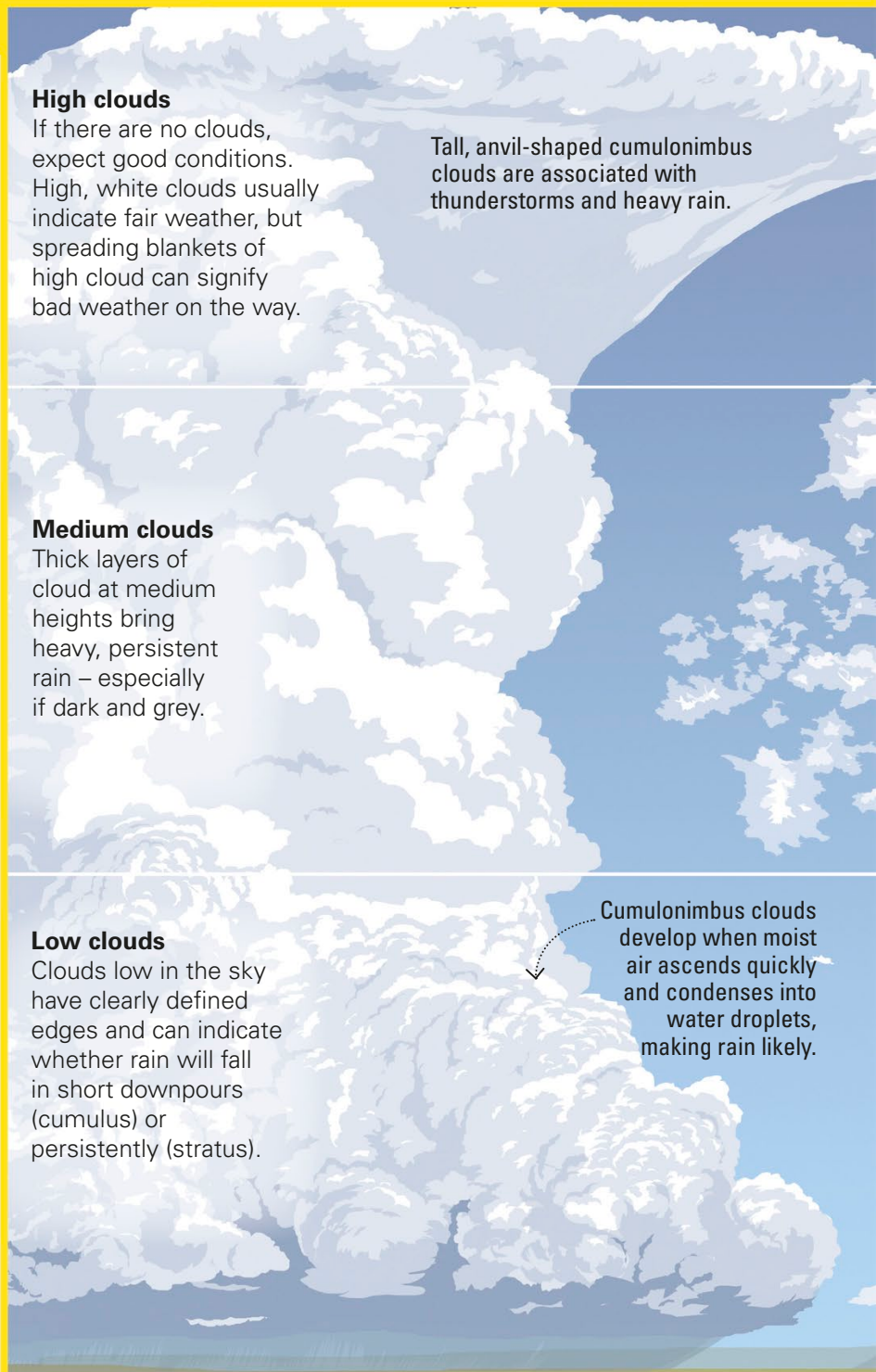
### Medium clouds

Thick layers of cloud at medium heights bring heavy, persistent rain – especially if dark and grey.

### Low clouds

Clouds low in the sky have clearly defined edges and can indicate whether rain will fall in short downpours (cumulus) or persistently (stratus).

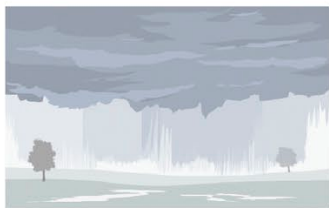
Cumulonimbus clouds develop when moist air ascends quickly and condenses into water droplets, making rain likely.





## WEATHER RISKS

A weather change can add danger to a trip, affecting temperature, visibility, the state of the ground, and morale. Weather on top of a peak can be different to that at the bottom, so prepare for both.



### Heavy rain

In heavy rain, the ground may become slippery. Seek shelter or put on waterproofs and proceed with caution.



### Fog

A cloud at ground level, fog reduces visibility. If you can't see where you're going, stop walking and take shelter.



### Lightning

A lightning bolt will strike the first object it meets, so avoid high, exposed places and never shelter under a tree.

Wispy cirrus clouds may be the first sign of fine weather ending.

Thick layers of cirrostratus clouds high up warn of wet weather on the way.

Alto cumulus clouds develop as cells and often signal a thunderstorm after hot, dry weather.

Altostratus cloud forms a blanket across the sky and often indicates rain on the way.

Nimbostratus clouds may follow altostratus and bring moderate to heavy, persistent rain.

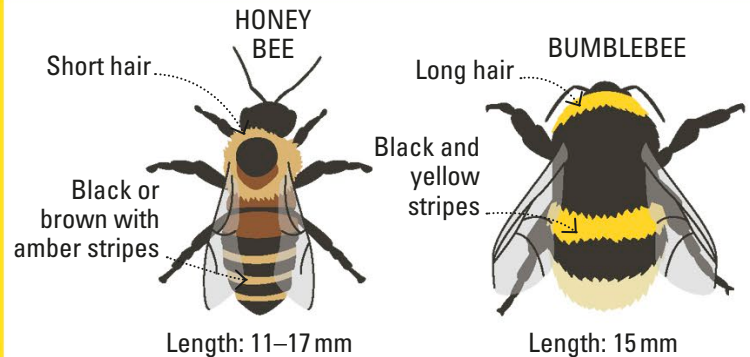
Stratocumulus cloud covers the sky in a grey or white sheet that can bring drizzle or snow.

Dense, grey stratus cloud covers the sky and can bring long periods of rainfall.

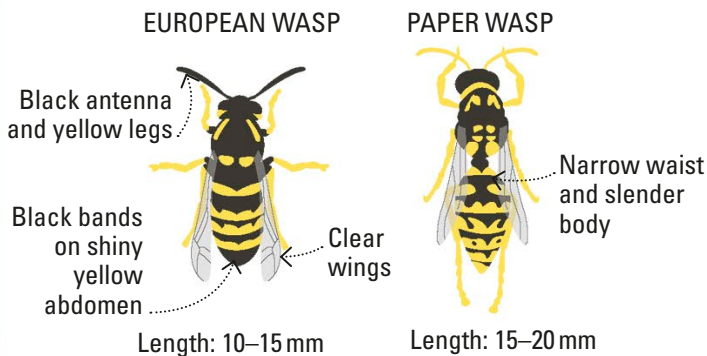
Fluffy cumulus clouds often develop on bright, sunny days, and indicate fine weather.

# INSECTS AND ARACHNIDS

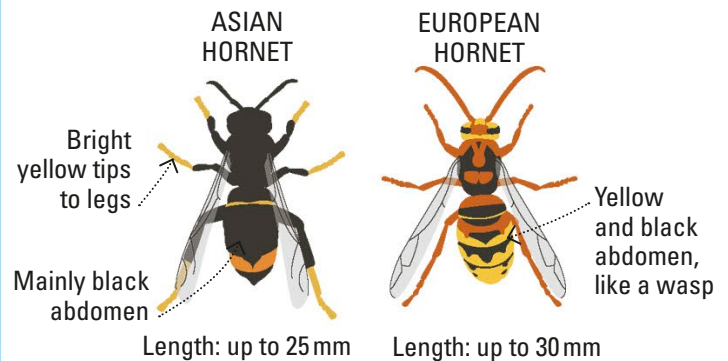
Biting, stinging **creepy-crawlies** are found in all parts of the world. Before you set out on a trip, **familiarize yourself** with the harmful insects and arachnids (spiders, scorpions, and ticks) in the region you are visiting. **Venomous** effects range from an itchy, painful nuisance to life-threatening poisons. **Bites and stings** may trigger allergic reactions, and some species are carriers of serious diseases. Here are some to look out for.



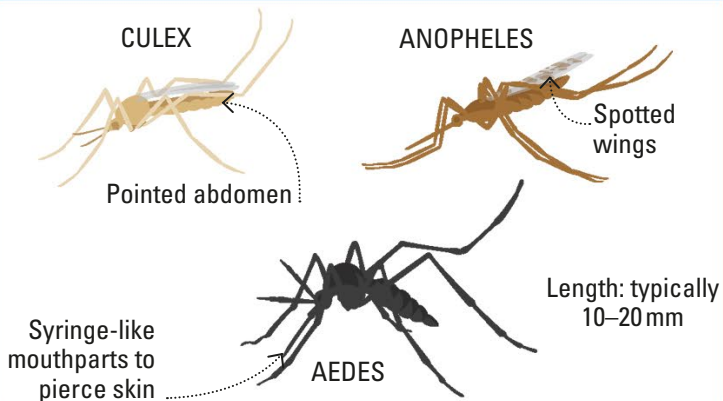
**Bee species live worldwide**, building nests in trees and holes in the ground. Look out for bees feeding in flowers and take care not to disturb nests. A bee stings only once, but can cause severe allergic reactions in some people.



**European wasps** make nests underground and in logs, while paper wasps nest in branches. Take care if gathering fruit or cleaning fish as the smell will attract wasps, which can sting repeatedly.

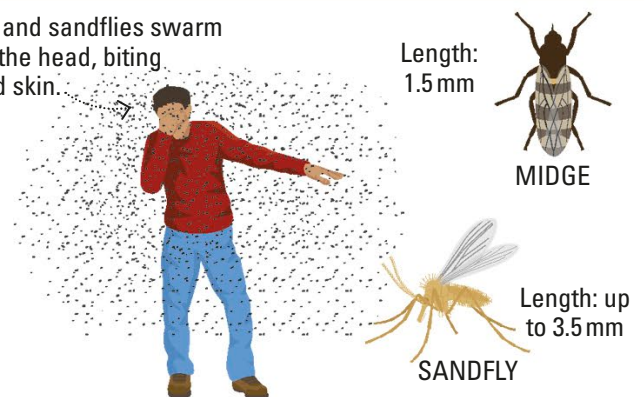


**About twice the size** of wasps, hornets can bite and sting, but are less aggressive, stinging only when provoked. They make nests in hollow tree trunks or hanging from branches.



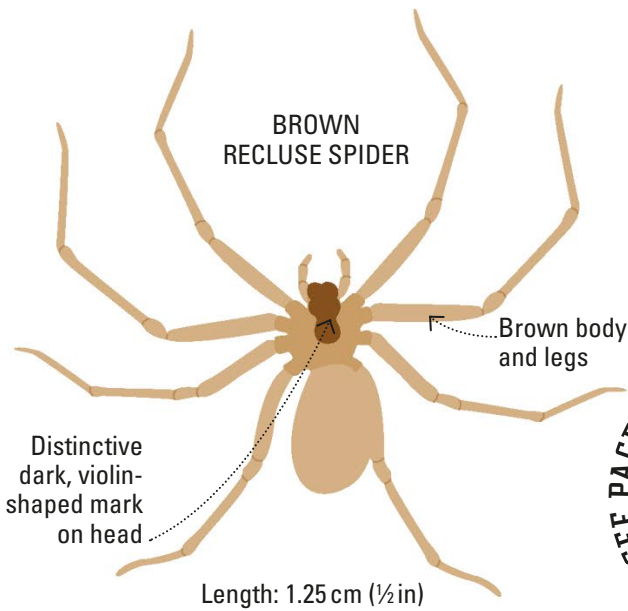
**Mosquitoes** live near water in warm regions. The bites of females can irritate the skin and some carry diseases such as malaria. Cover skin at dusk, use repellent, and sleep under a net.

Midges and sandflies swarm around the head, biting exposed skin.

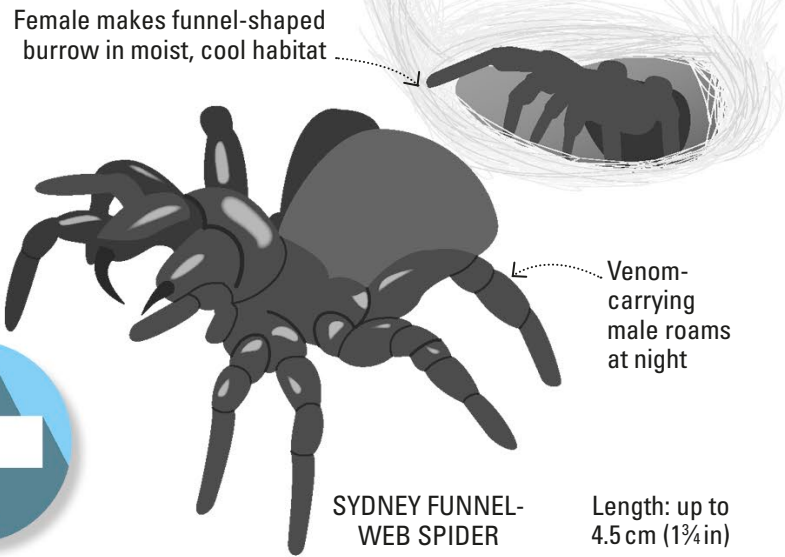


**Tiny, bloodsucking flies** found near water, biting midges and sandflies can be a nuisance in summer, passing through nets and getting into tents. Cover skin with light clothing and apply repellent.

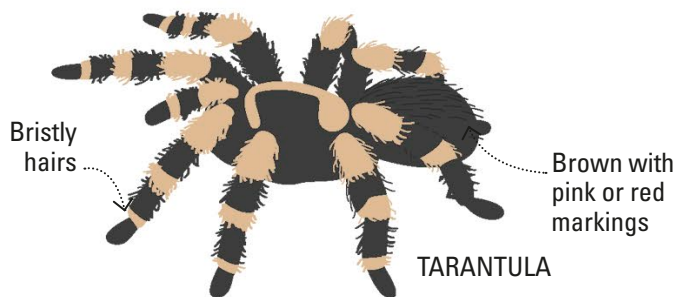




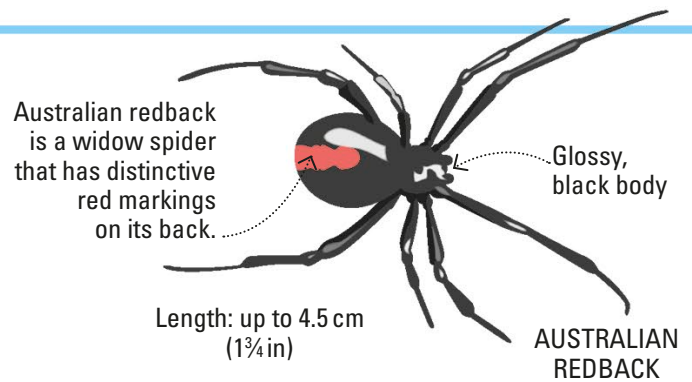
**Found in the southern US Midwest**, this spider is known as a fiddleback. Its bite is rarely fatal, but can cause fever, chills, vomiting, and joint pain. It hides in dark places, so always check boots and bedding.



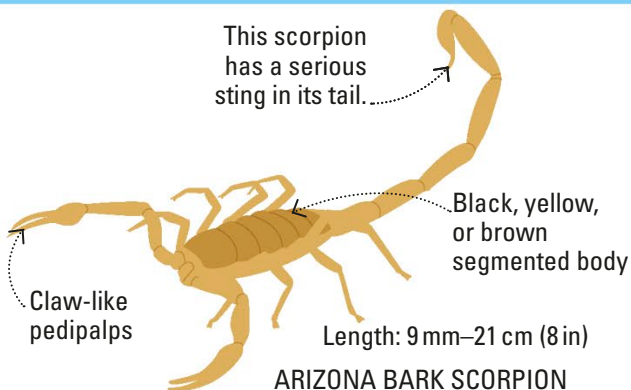
**The venomous Sydney funnel-web spider** has a glossy black body and short legs. Its painful bite causes sweating, nausea, and weakness, but is rarely fatal. Take care when moving rocks and logs.



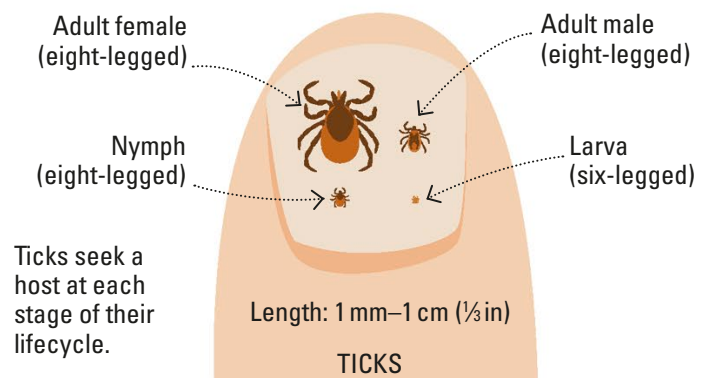
**Tarantulas are giant spiders** that live in tropical forests. They hunt at night and have a mildly venomous bite. If irritated, tarantulas flick itchy hairs from their abdomen. Move away if you see one – don't touch it.



**Small, dark widow spiders** live in warm regions worldwide. Their painful bite can lead to sweating, chest pains, and nausea. It is rarely fatal. Watch out for webs in shrubs or among rocks or logs.



**Scorpions live in warm regions** worldwide. Their very painful stings may cause severe illness and temporary paralysis, but are rarely fatal. Check boots and beds, and take care when gathering firewood.



**Found in woods and grassland**, ticks feed on warm-blooded animals (hosts). They can carry disease. Wear long trousers and use a repellent. Check skin and brush off ticks before they dig in.

SEE PAGES 116-117  
BITES

# ANIMAL ENCOUNTERS

When outdoors, you might meet **wild animals**. Most try to avoid contact with humans, but some, especially bears, might come closer looking for food. If animals are **provoked**, cornered, or surprised, they may attack to defend themselves, especially if they have young.

## BEARS

When walking in bear country, equip yourself with bear spray and bells (see the panel on page 47).

If a bear stands up, it is trying to work out what you are; it is not the first step of an attack.

HEY!

Never turn your back on a bear; face it and observe it all the time.

**3** If the bear approaches you, talk to the bear and wave your arms. If it comes closer, and looks about to attack, stand your ground. Use your bear spray or throw objects.

## STEP BY STEP



**1** If you come across a bear and it spots you, stay calm, talk to the bear, but avoid eye contact. Ready your bear spray.



**2** Make yourself as large as possible and group close together if you are with others. If the bear keeps its distance, back away slowly. Do not run or climb a tree.



**4** In case it does attack, if it's a black bear, fight for your life, aiming to hit its eyes and nose. If it's a brown bear, drop face down and play dead.



## CATTLE

Be mindful of farm animals. If there are bulls, or cows with calves, in a field, try to pick another route.

47

Close gates behind you when walking through fields containing livestock.

Move quickly and quietly around the herd, not too close.

If cows move towards you, walk towards them and shoo them away.

## MOOSE

If you spot a moose, stop still to see where it's heading. Allow it plenty of personal space – at least 15 m (50 ft).

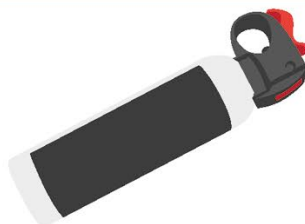
If the moose ignores you, let it pass and don't move until it has disappeared.

Never get between a female moose and her calf; keep well away if you see any young.

If the moose moves towards you, run for cover behind a rock or a tree. Moose are fast (so just running away won't help), and attack by kicking with their front hooves.

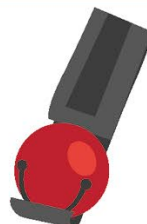
## ARMING YOURSELF

Before venturing out, research the animals that live in the area, which ones might be dangerous, and what to do if you spot them. National park websites often have specific information. Always carry preventive or defensive items, in case you get charged by an animal that feels threatened.



### Bear spray

Aim bear spray at the eyes and nose. Do not spray on yourself.



### Bear bell

Shake bells, or anything that makes "human noise".



### Whistle

Blow a whistle, or sound an air horn, to make an "alien" noise.

# TIGERS

**Bengal tigers are the largest cat.** Found in Asia, they are unlikely to attack unless they feel provoked or that their cubs are threatened, but you should **avoid coming into contact** with them. If a tiger does attack, the outcome is usually fatal for the human.



Tigers don't usually climb trees but they can jump 4.5 m (15 ft).

**1** If a tiger sees you, stand still and upright, showing that you are not four-legged prey.

**HEY!**

**2** If the tiger approaches, do not turn away, make yourself as big as possible, and shout.

**3** If the tiger crouches, rolls back its ears, focuses on you, and snarls, it is about to attack. Pick up a weapon, such as a rock or large stick, or use a pepper spray to fight for your life.

## DO'S AND DON'TS

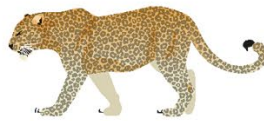
- ✗ If a big cat spots you, never crouch or bend down.
- ✗ Never run – this will trigger the cat's hunting-prey instinct.
- ✗ Stand your ground, even if the cat charges – it's likely to be a mock attack.
- ✗ Never turn your back to the cat.

## OTHER BIG CATS

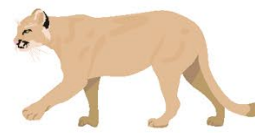
Avoid all big cats and remember that they rarely attack unprovoked. However, those that live near cities, towns, and villages are more likely to attack humans.



**Lion**  
Found in Africa, this cat's charge and loud roar are scary, but stand your ground.



**Leopard**  
This tree-climber and cave-dweller lives in Africa and Asia. Always avoid its gaze.



**Cougar**  
Also known as puma, or mountain lion, cougars live across the Americas.



**Lynx**  
The lynx and bobcat live in North America, with other types of lynx in northern Eurasia.



## HIPPOS

Weighing up to 3 tonnes with long, sharp teeth, hippos should be avoided at all costs, on land and in water.

This is not a yawn but a sign of aggression, showing tusks and teeth.



If you are threatened, make every effort to escape as quickly as you can.



Look out for partly submerged hippos – collisions and attacks are usually fatal.



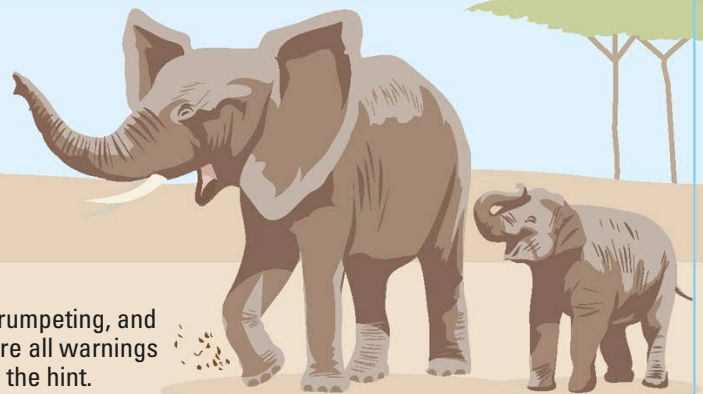
## ELEPHANTS

Elephants run faster than you, and will charge if threatened. Keep away, especially if they have young.

**1** If you spot an elephant, identify a safe place, such as a rock, big tree, or vehicle.



**2** Flared ears, trumpeting, and kicking feet are all warnings to back off – take the hint.



**3** If threatened, run for your safe place to put a barrier between you and the elephant.

## SNAKES

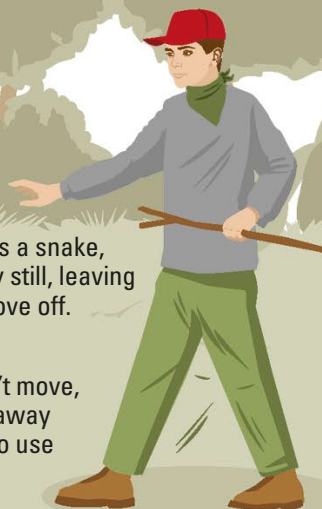
If you are in snake country, use a stick to tap the ground. Most snakes will avoid you and slither away.

**4** If the snake attacks, hit it hard on the head.



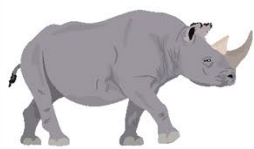
**2** If you come across a snake, remain completely still, leaving the snake space to move off.

**3** If the snake doesn't move, then move slowly away with your stick ready to use in defence.

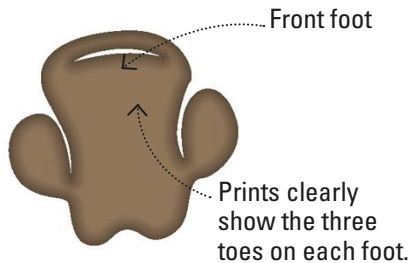


**1** Wear clothing that makes you less exposed to a snake bite – for example, long trousers, boots, and a scarf to cover your neck.

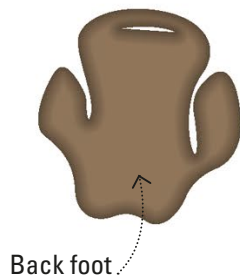
Most animals leave signs of their **presence**: flattened vegetation **showing** where they have rested or passed, as well as **footprints**, or **scat** (droppings). Being able to spot and recognize these signs will help you to be aware of who and what is in the area, and whether they might be a threat.



RHINOCEROS



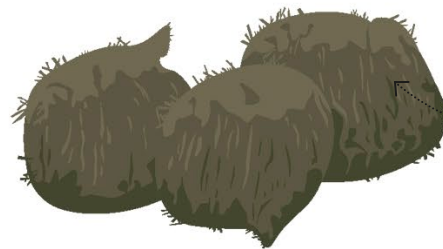
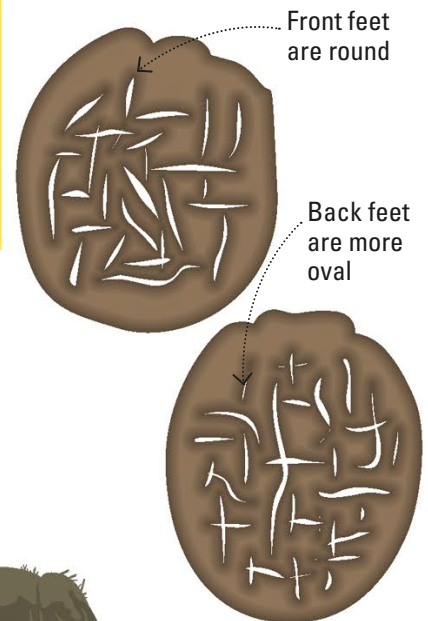
Rhino dung, often dropped in large, flat poo piles known as middens



**Black rhinos** nibble from trees and bushes, and small woody pieces can be seen in their dung. Solitary and territorial, they add their dung to huge piles as a way of communicating with other rhinos.



AFRICAN ELEPHANT

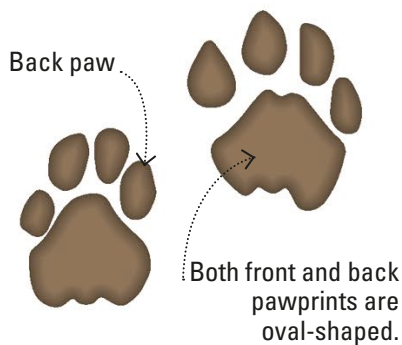


Typically round balls of elephant dung, full of undigested grass

**African elephants** can weigh up to 6 tonnes and leave huge tracks with imprinted cracks; the toes rarely show. The sound of branches cracking can announce an elephant approaching nearby.



LION



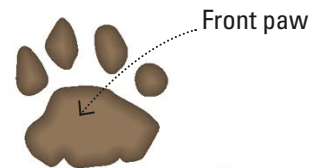
Lion scat contains fur, small bones, feathers, or quills.

**Lions** hunt in groups both day and night, but spend most of their time lying about with their pride. If unsuccessful they scavenge for carrion. Dark, strong-smelling scat is a sign of a fresh kill.

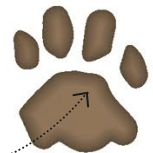


LEOPARD

Long, segmented scat, usually full of fur

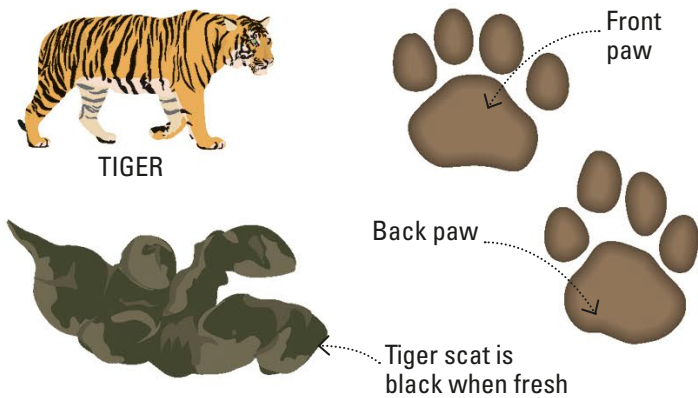


Paw prints are smaller and rounder than those of a lion

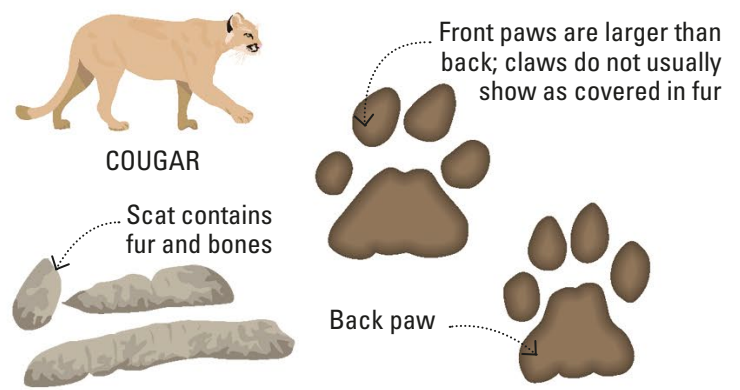


**Leopards** are solitary, secretive hunters, most active at dawn and dusk. Apart from tracks and scat, a carcass hung up in a tree is a sure sign a leopard is around – avoid approaching any kill.

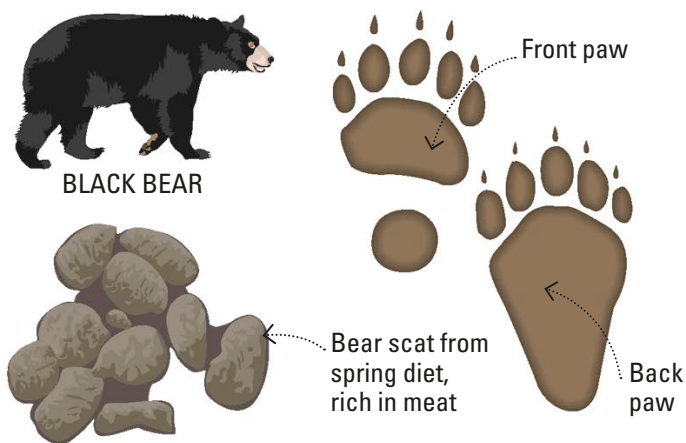




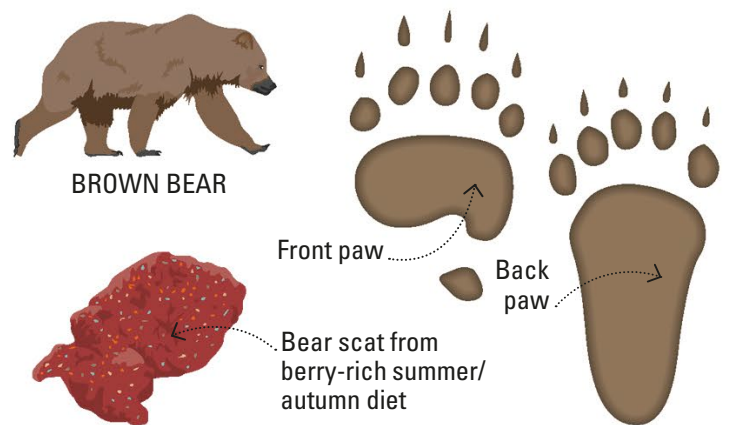
**Tigers** live across Asia, with Bengal and Siberian tigers being the largest in size. Like other big cats, they prefer a carnivorous diet and their scat is full of hair, sometimes from much larger animals.



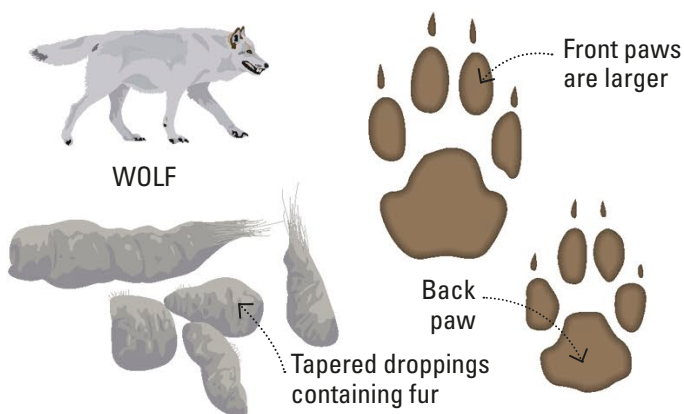
**Cougars**, also known as mountain lions or pumas, are the largest cat in the Americas. They are shy, but encounters are becoming more common as people hike and camp in their habitats.



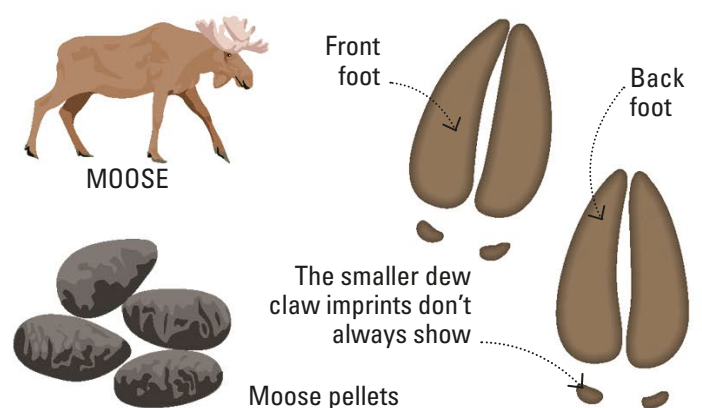
**Black bears** live in mountainous areas across North America and encounters are common in nature reserves. Omnivores, they can run fast, swim, and climb. An average male weighs over 130 kg (287 lb).



**Brown bears** inhabit the wilds of northern Eurasia and North America. Also omnivorous, they are larger and heavier than black bears. Their toes are closer together and less curved, with longer claws.



**Wolves** roam in packs across habitats in northern North America and Eurasia. Humans are not natural prey, but wolves can attack if they feel threatened. Tracks are bigger than those of dogs and coyotes.



**Moose** are common in Canada, northern USA, Scandinavia, the Baltic states, and northern Russia. The largest of the deer family, they leave oval pellets, up to 3 cm (over 1 in) long.

# AVOID HEAT INJURY

**Heat exhaustion** can develop when the body heats up and cannot **cool down**. If not recognized and treated, it can quickly develop into **heatstroke**, which must be treated as an **emergency**. **Prevention** is better than a **cure**, so follow these tips to avoiding a **heat injury**.

## WARNING!



Call emergency services for help if these signs of heat exhaustion develop and become worse:

- ☐ headache
- ☐ pale, clammy skin
- ☐ dizziness and confusion
- ☐ fast breathing or pulse
- ☐ cramps
- ☐ loss of appetite
- ☐ excessive sweating
- ☐ feeling sick



- 1** If possible, avoid walking when the day is at its hottest. Walk in the shade, wear a hat and sunglasses, and apply sunscreen often.

## STEP BY STEP



- 2** Drink frequently, even if you don't think you are thirsty, so that your body stays hydrated. The body loses water through sweat and this needs to be replaced.



- 3** Layers allow you to add and remove clothing in order to regulate your body heat. Take off layers if you are too hot to help your body cool down.



# ESCAPE QUICKSAND

53

**Quicksand** is a mixture of water and sand, or sand and air, that cannot take any **weight**. It looks **solid**, but the surface of quicksand **collapses** when it is stepped on and can **suck** or **drag** you down. It is found on **riverbanks**, on **beaches** at low tide, and around **springs**.



## DO'S AND DON'T'S

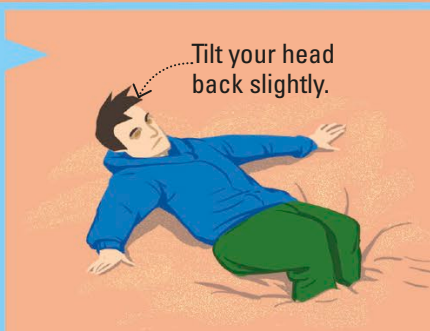
- ✓ Do use a long stick, or staff, to check the ground in front of you.
- ✓ Do check the route on a map and avoid areas where there are known quicksands.
- ✗ Don't walk on if your feet start sinking into the ground more than ankle deep. Turn around and find another route.

**3** If someone is with you, he or she needs to lie on solid ground and pull you towards them using your walking staff, a rope, or a branch. Do not pull them in!

## STEP BY STEP

**1** If trapped, remove your backpack and lie gently on your back with limbs outstretched to spread your weight and help keep you on the surface.

**2** Remain calm and do not struggle. Struggling makes you sink faster. Slowly and gently, paddle with your hands towards solid ground.



# MOVING OVER SNOW

Preparation is essential for **hiking in cold weather conditions**. Wearing **snowshoes** or **skis** is an effective way to move over snow as they **spread your weight** over a larger surface area, reducing the amount you sink in. Wear **breathable, layered clothing** and **set off slightly cool**, as you'll warm up fast.

**AVOID WALKING OVER DEEP SNOW WITHOUT SNOWSHOES AS IT WILL SOON TIRE YOU OUT.**

A backpack keeps your arms free.

Layers of breathable clothing keep you warm without overheating.

Ski goggles protect your eyes from glare.

Avalanche transceiver in pocket

**When travelling over snow**, your main aim is to get to your destination as safely as possible, without expending too much energy or losing too much body heat.

Ski poles can be used to propel you and to test the snow ahead.

Waterproof trousers keep your legs dry.

Skis stop you sinking into the snow.

## COLD ESSENTIALS

Exposure and hypothermia are the main threats in cold environments. Sweating from exertion and getting wet can both lead to hypothermia.

- Dress in loose-fitting layers, stay dry, and avoid overheating.
- Avoid sitting on snow and ice as it lowers your body temperature.
- Shelter from the wind when possible to avoid wind chill.
- Warm cold hands under your armpits – not with your breath, which will make them wet.

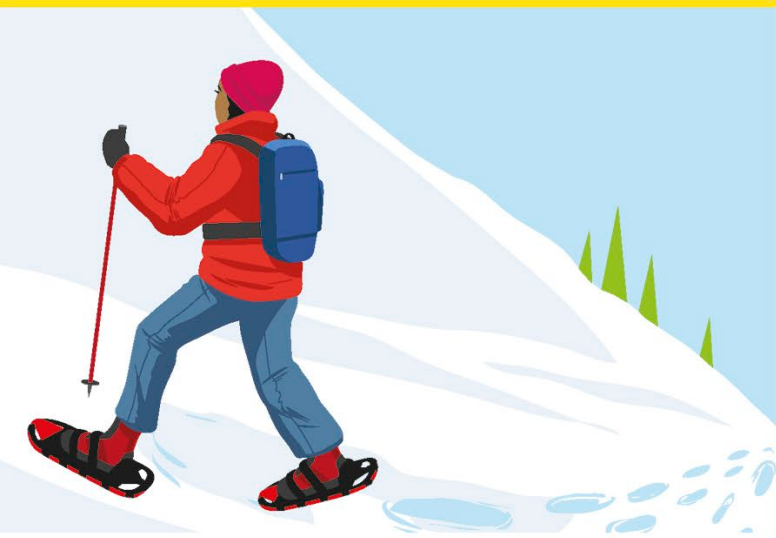




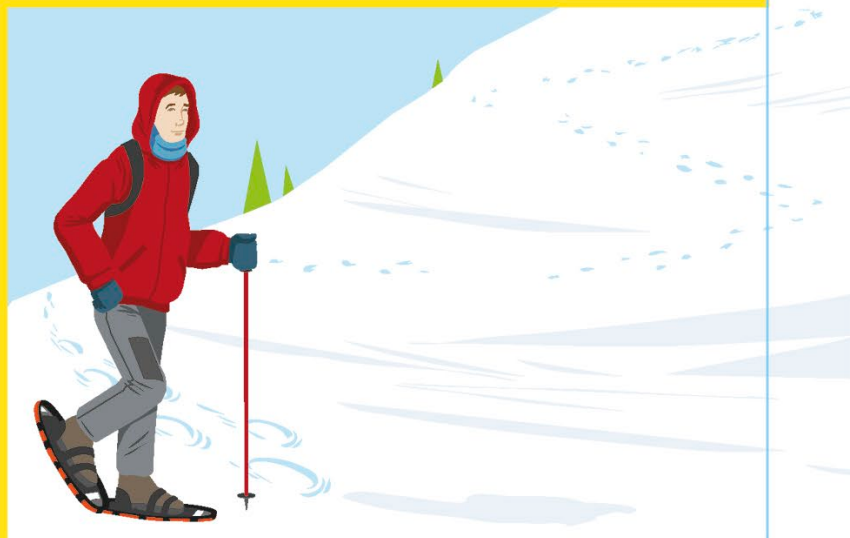
**If in deep snow** in a group, walk in single file and take turns at the front (the most strenuous position) to create a path without getting too exhausted.



**An ice crust** above deep snow may take your weight, but progress carefully. Use a walking staff or pole to test the surface ahead for support.



**Going uphill**, kick firmly into the slope with the toe of your boot and test your weight as you ascend. On crusty, hard-packed snow, try to find an easier route.

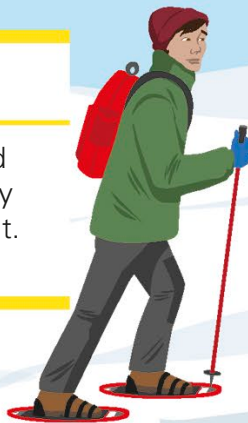


**Zigzagging downhill** puts less strain on your knees and leg muscles, especially if the terrain is steep. If wearing skis, you may be able to take a more direct route.

## BEWARE OF ICE

Ice over frozen streams, rivers, and lakes can be unpredictable and very dangerous, so never venture onto it.

**1** Never go on ice, as it may be thin and crack beneath your weight. Always find a route around it.



**2** Be aware of the risks. If you fall through the ice, unseen currents can drag you under and hypothermia may set in very fast.

**3** Never follow your dog onto ice. It probably weighs less than you and distributes its weight differently. If it falls through, get help.



# MAKING SNOWSHOES

If you don't have any snowshoes, you can **make simple shoes** to help you **negotiate the snow** more effectively. They may take time to build, but will **save time and effort** in the long run.

**TIE PLASTIC BAGS AROUND YOUR LEGS TO KEEP THEM DRY.**

## WALKING ON BRANCHES

For short distances over deep snow a simple pine bough with strong, close branches can be lashed to your boots.

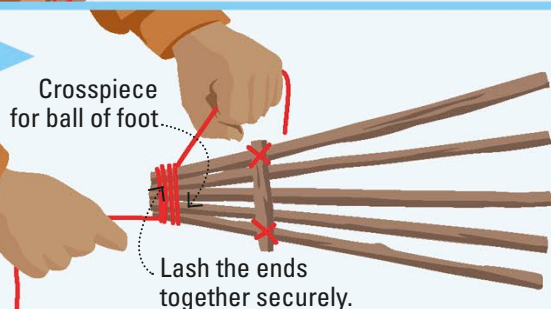


**3** Place your boot on the snowshoe and lash your boot to the two front crosspieces. Ensure that your heel can move from side to side.

Ensure the ball of your foot sits over the front crosspiece.

The heel should be free to move up and down, and side to side.

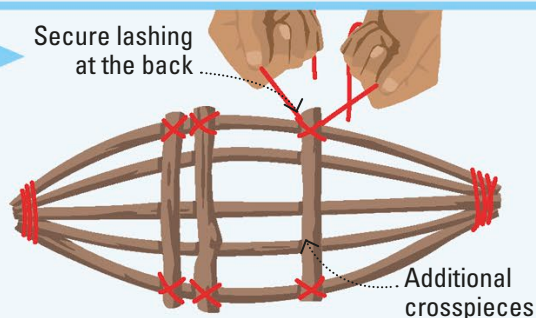
## STEP BY STEP



Crosspiece for ball of foot

Lash the ends together securely.

**1** For each shoe, cut five lengths of green wood as thick as your thumb and as tall as your armpit. Securely lash the ends together. Lash a crosspiece where the ball of your foot will rest.



Secure lashing at the back

Additional crosspieces

**2** Lash the five loose lengths together at the back of the shoe. Secure a second crosspiece 5 cm (2 in) behind the first and a third crosspiece where your heel will rest.



# ICE AXE SELF-ARREST

57

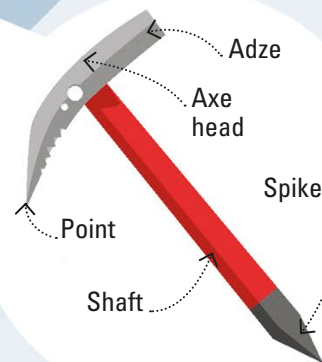
When out in cold weather conditions, an **ice axe** is a **useful piece of equipment** to carry. It can aid movement over snow and ice, and help you to **stop a downward slide** that could otherwise end in serious injury.

Bend your knees at right angles to keep your feet up so they don't dig into the snow and flip you over backwards.

Keep your head up and to the side.

Make sure you can reach your ice axe when you need it.

**4** Act quickly, as the longer you wait, the faster you will accelerate down the hill, making it harder to stop. Bend your knees 90 degrees to keep your feet up so they don't dig into the snow and flip you over backwards.



## STEP BY STEP



**1** If you fall or slip and start to slide downhill on your backside, lift your feet up so you don't cartwheel forward.



**2** Hold the end of the ice axe's shaft in one hand and tuck the adze (short end of the axe head) into the soft part of your shoulder under your collarbone.



**3** Roll over as you slide until you are face down and, using your shoulder, body, and the momentum of your roll, drive the point of your axe into the snow.

# DRESSING FOR SURVIVAL

Choose **fabrics** and **clothes** suited to the **environment** you are travelling in. Wearing **layers** helps you to **control your body temperature**. Too much clothing can lead to **heat exhaustion** and **heatstroke**; too little can lead to **hypothermia**. Adjust your clothing to maintain a comfortable temperature for the activity you are doing.

**WEAR NEW BOOTS AROUND THE HOUSE OR ON SHORT HIKE TO BREAK THEM IN.**

## THE RIGHT FOOTWEAR

### Sandals

Modern sandal designs are comfortable, give support, and provide ventilation.



### Lightweight boots

Hybrids combine the support of a heavy boot with the flexibility of a sports shoe.



### Hiking boots

A good, all-round leather boot combines weight, durability, and protection.



### Walking socks

Socks cushion the feet and wick moisture away to keep feet warm and dry.





## WARM WEATHER

It is vital to stay cool to avoid heat exhaustion. Choose breathable fabrics and protect your skin from sunlight.



Convertible trousers have legs that can be unzipped to make them into shorts.



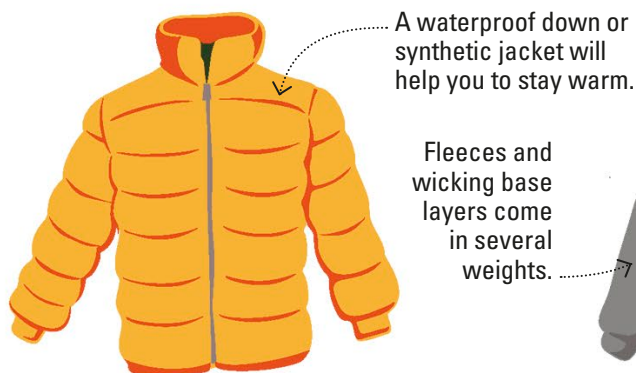
Desert hat combines a protective brim with neck protection.



Sunglasses, sunblock, and lip balm are hot-weather essentials.

## COLD WEATHER

Wear a lightweight base layer, several warm, insulating layers, and a windproof and waterproof outer shell.



Fleeces and wicking base layers come in several weights.



Sunglasses, sunblock, and lip balm are essential in cold weather, too.

Wear wicking, insulating leggings under waterproof trousers.



Gloves protect against frostnip and frostbite.



Balaclava keeps your face warm and protects it from winds.

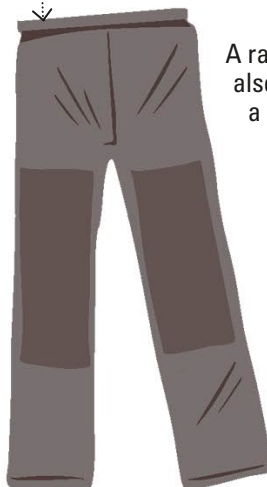


## WET WEATHER

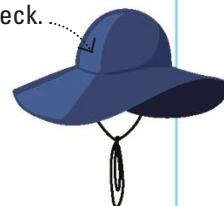
The best fabrics to wear are ones that are breathable, waterproof, and allow sweat to escape – such as Gore-Tex®.



Waterproof trousers keep your legs dry in wet conditions.



A wide-brimmed rain hat stops water running down your face and neck.



A rain poncho can also be made into a shelter or bed.



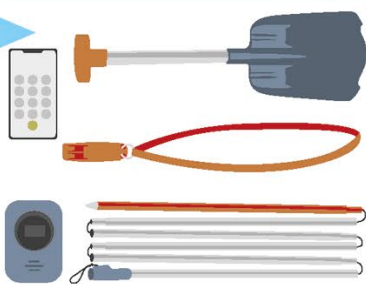
# SURVIVE AN AVALANCHE

The best way to **survive an avalanche** is to be prepared and take evasive action. **Check weather conditions**, learn the warning signs, take the right equipment, and practise the emergency steps. Most avalanches are **triggered by human activity**, such as skiing – more than 80 per cent of victims trigger their own avalanche.

AN AVALANCHE CAN TRAVEL AT 129 KM/H (80 MPH) - TOO FAST TO OUTFRAN.



## STEP BY STEP



**1** Carry an avalanche transceiver, a mobile phone, a whistle around your neck, and a collapsible shovel and pole. Don't ski alone and take notice of warning signs.

Snow will be fastest near the centre.



**2** Before you set out, check conditions online, on local radio, and with mountain guides. If you see or hear an avalanche, try to ski out of the way at right angles to its path.



**3** If you can't avoid the avalanche, take cover behind a solid object (a rock or tree) and hang onto it. Remove bindings from skis and loops from ski poles.



## WARNING SIGNS



There's always a danger of avalanche on slopes that face away from the sun in midwinter, when a fresh layer of heavy snow sits on top of a weak layer. Beware of:

- Snow that falls as crystals or pellets (called depth hoar or sugar snow)
- Loose, dry snow that does not settle
- Convex slopes at an angle between 30 and 45 degrees
- Slopes without trees or rocks
- Soft, newly fallen snow that is more than 30 cm (12 in) deep
- Snow that sounds hollow
- Snow that falls at more than 2.5 cm (1 in) in one hour



Keep your transceiver easily accessible in a secure pocket.

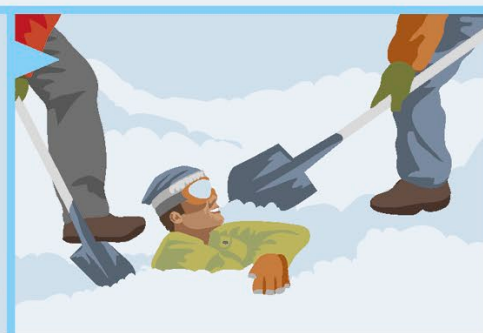
Keep small survival aids in your pockets so they are with you at all times.

Activate the transceiver immediately – it emits a signal that can be detected by rescue services.

**4** If caught in the avalanche, “swim” with the flow to stay near the surface. Swim on your back with your face turned towards the surface, giving you a better chance of getting oxygen if you get buried. Ditch anything heavy such as a backpack that may drag you down.



**5** If you are buried, try to keep calm. Clear the snow around your face and create a space for you to breathe, as often people suffocate before they freeze. Oxygen = survival.



**6** If you don't know which way is up, dribble saliva to find out which way is down. If you are near the surface, dig your way out. Blow your whistle or shout if you hear rescuers to attract their attention.

# CROSS A RIVER

If you have to cross a river or wide stream, find the **safest crossing point** – ideally a bridge or ford (area of shallow water). If you do need to enter deeper water, **be aware of the risks**, which include drowning or, in cold conditions, hypothermia. Even shallow or calm-looking rivers can have **fast currents**. Look upstream and downstream for the best place to cross.

**NEVER CROSS WHITE WATER, OR RIVERS THAT HAVE FLOODED.**

Don't cross on the outside of bends, where water is deeper and faster.

Check both banks for dangerous animals.

Check the river upstream – it may be shallower and easier to cross.

Exposed rocks can be slippery as water flows faster when channelled around them.

Try to cross on the inside of bends, where water is slower and not as deep.

## STEP BY STEP



**1** To keep your clothes dry and reduce water resistance, change into shorts or take off your trousers. Remove your socks, but keep footwear on to protect from sharp rocks.



**2** Keep a change of clothes dry inside a plastic bag in your rucksack. If it's cold, do the same with fire-making materials (tinder and kindling), ready for the other side.

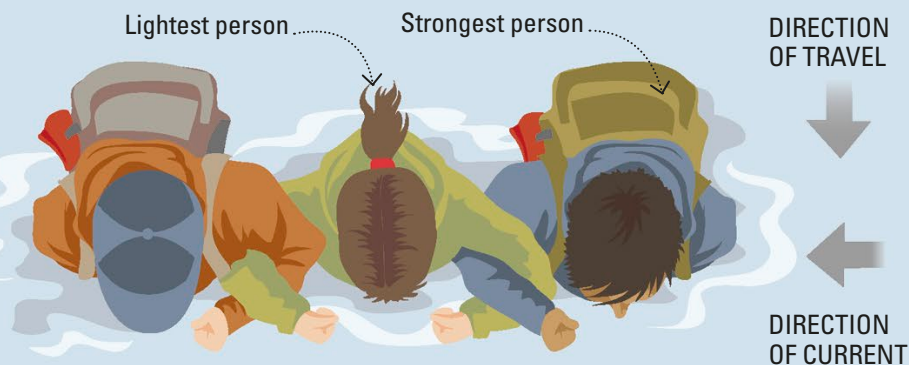


**3** Use a walking staff or a strong stick for support. Try to enter the water on a shallow bank. Before each step, poke the mud or sand to check you won't sink into it.



## CROSSING IN A GROUP

It's safest to cross a river as a group. Huddle in a circle with arms on shoulders, or link arms to form a line with the lightest person in the middle. The strongest person should bear the force of the current with the others behind.



Avoid crossing near debris or fallen trees or branches – they can float free and become dangerous floating hazards.



Look out for unusual changes in flow – there could be rocks beneath.

Use the stick to gauge water depth and the speed of the current, and to feel for rocks on the riverbed.

**4** Facing into the current, walk diagonally, taking small, careful steps. Lean on the stick to keep two points of contact (foot and stick) on the riverbed at all times. If possible, head for a shallow bank to exit the river.



**5** Tip water from your boots, and dry your legs and feet, perhaps with a spare T-shirt. In very cold weather, light a fire to dry your boots and any wet clothing.

# BUILD A RAFT



Sometimes it is quicker and easier to go over a **water obstacle**, not around it. If the water is not too cold, improvise a **flotation aid** to help you swim. If you have time, build a raft – most float half-submerged, so **prepare to get wet!**

**AIR-FILLED BOTTLES OR PLASTIC BAGS MAKE GOOD FLOTATION AIDS.**

## DONUT BOAT

Weave natural materials together, bind together with cordage, and cover with a waterproof tarpaulin or shelter sheet to make a donut boat.



## STEP BY STEP



**1** Use sticks to peg out an oval smaller than your cover, which will fold up over the raft's sides. Weave saplings, hay, or straw in and out of the pegs to form the sides.



**2** Push through long sticks near the bottom, criss-crossing them to form a lattice platform to sit on. Use cordage and arbor knots (see pages 80–81) to tie the sides in six places.



**3** Remove the pegs and lay the donut on the cover. Pull up the sides of the cover and tuck securely inside between the bottom of the sides and the floor.



## LOG RAFT

Almost anything that floats – natural or human-made – can be used to make a raft. You just need to lash the materials together.

**2** Cut notches along the ends of the logs so crosspieces can sit snugly.

**3** Lash the top and bottom crosspieces together.

**1** Find logs of roughly the same diameter.

65

## BAMBOO RAFT

The hollow sections inside its poles make bamboo very light. More buoyant than most logs, bamboo is perfect for raft-making.

**1** Trim bamboo poles to roughly the same length.

**2** Lash crosspieces to the raft.

**3** Tie on two more lengths of bamboo to hold the crosspieces in place.

## BARREL RAFT

Metal or plastic barrels or drums make great rafts. Don't touch any barrels that may have contained toxic chemicals.

**3** Lash logs or planks on top to form a platform.

**1** Use four barrels to make a raft big enough for one or two people.

**2** Ensure any openings or caps sit above the water level.

# CANOE RESCUE

In a canoe, the paddler kneels or sits and uses a single-bladed paddle on one side. Keep a canoe stable by **distributing weight evenly** and not overloading it. If you're with a group and you capsize, your best option is **canoe-over-canoe rescue**. This is a technique that uses a second canoe to help right the one that has overturned.

Crew of the rescue canoe help pull the capsized canoe up and across their boat.

Always wear lifejackets for canoeing, kayaking, or any time you are on the water.

Other people in the water should support the rescue canoe.

**2** If you cannot turn the canoe, guide it towards a second, rescue canoe. Tip one end down to raise the other end up. The rescuers must pull the canoe up and slide it across their own boat, and rotate it to tip out the water.

Push down on this end of the canoe to lift up the other end.

## STEP BY STEP



**1** If you feel your canoe might overturn, head towards shallower water. If you do capsize, remain calm. Try to turn over the canoe in the water.



**3** Rotate the canoe to its upright position and slide it into the water. The rescuer must hold both canoes together to allow you to climb aboard again.



# COLD WATER SHOCK

67

Cold water shock is the body's reaction to **sudden immersion in cold water**. It can be fatal – even for strong swimmers in temperate climates. It causes **gasping for breath** and **hyperventilation**, which can result in the inhalation of water, panic, disorientation, hypothermia, or even cardiac arrest.

IF YOU MUST ENTER THE WATER, DON'T JUMP IN. LOWER IN SLOWLY TO REDUCE THE SHOCK.

Keep nose and mouth above water.

Float on your back if you can.

**1** If you find yourself suddenly immersed in water, stay calm and use the minimum effort to remain afloat. Let your body get used to the change in temperature – don't panic and fight it. Lean back slightly to keep your mouth above water.

After a few minutes, when the initial shock has passed, remove shoes or heavy clothing that could drag you down.

## STEP BY STEP



**2** When you have caught your breath and feel under control, tread water and look around for something to swim towards or to hold onto. Call for help.

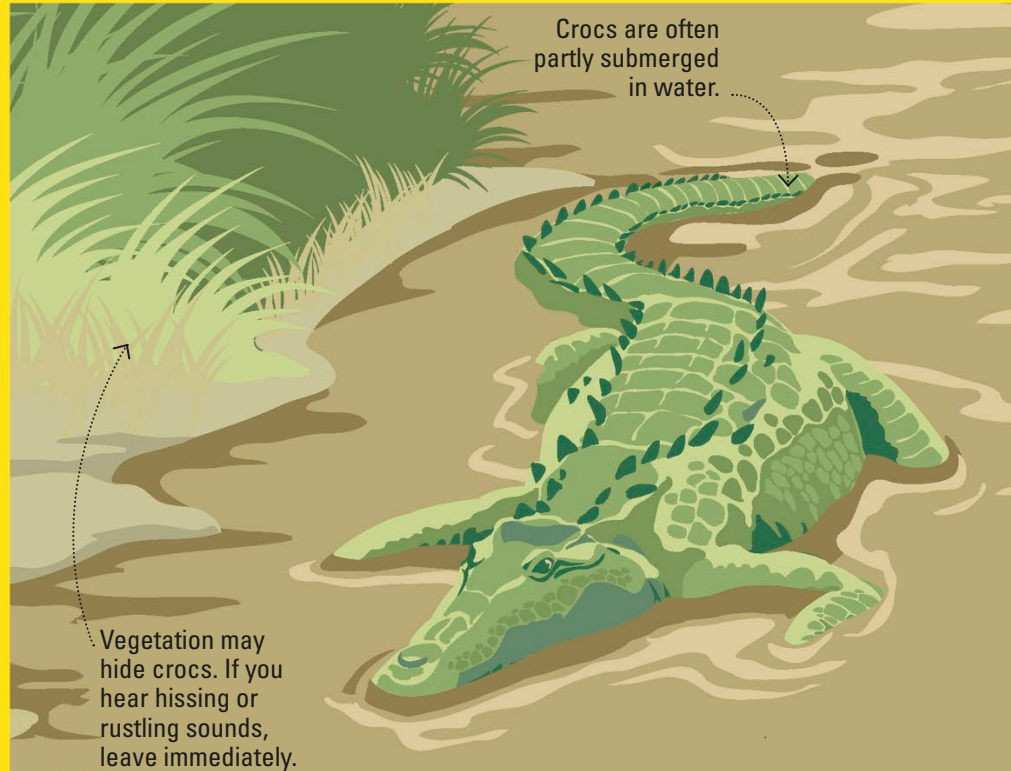


**3** If you decide to swim to safety, doggy paddle by scooping water with your hands and kicking your legs. If you get tired, float on your back or try backstroke.

# ESCAPE A CROCODILE

Crocodilians, which include **gharials, alligators, and crocodiles**, live in tropical and subtropical regions. They hunt mainly at night, but they can also be active during the day. In croc territory, **never enter the water** or walk within 6 m (20 ft) of it. The best defence against a croc is **distance**!

**DON'T STORE FOOD OR CAMP WITHIN 50 M (165 FT) OF THE WATER'S EDGE.**



Pay attention to any warning signs. However, there may be crocs even if there are no signs.



- 1 Don't panic if you see a croc – it may not know you are there. Back away quietly and slowly, making no sudden movements or noise.



## STEP BY STEP



- 2 If the croc charges, run away as fast as you can. Crocs can run up to 30 km/h (about 20 mph), but only for a short distance. Shout for help or find a tree to climb.



- 3 If the croc grabs you, attack its eyes (or snout) with your fists or thumbs. If it tries to pull you underwater, take a breath and keep gouging.

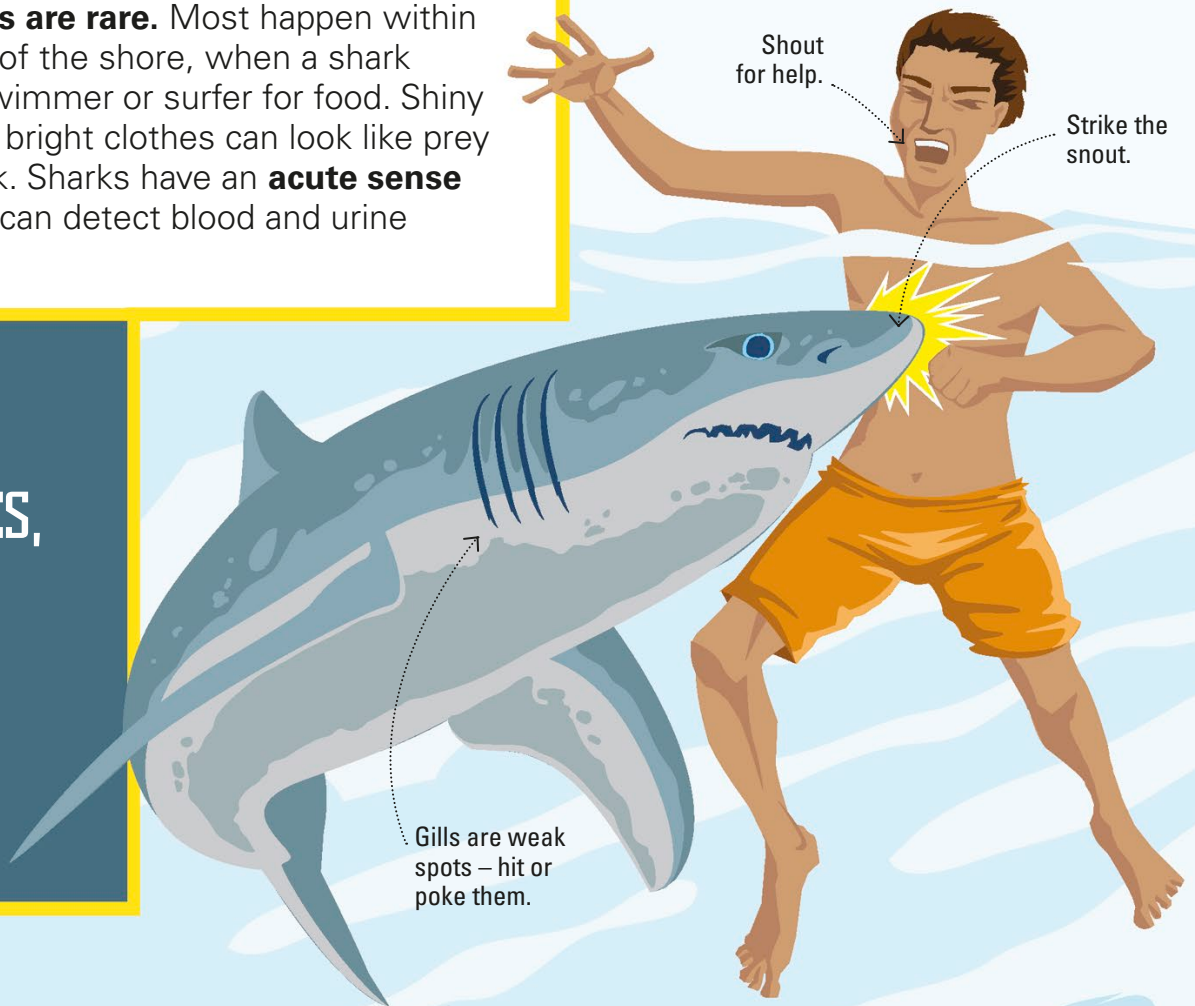


# DEAL WITH A SHARK

69

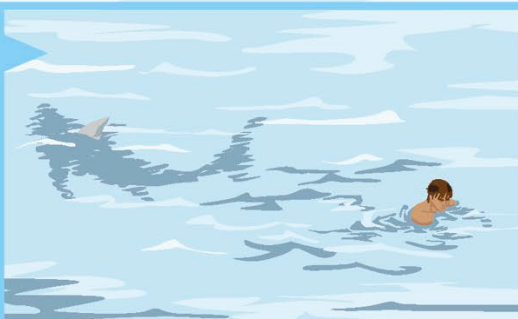
**Shark attacks are rare.** Most happen within 30 m (100 ft) of the shore, when a shark mistakes a swimmer or surfer for food. Shiny jewellery and bright clothes can look like prey fish to a shark. Sharks have an **acute sense of smell** and can detect blood and urine in the water.

CHECK  
BEACH  
NOTICES,  
AND  
SWIM  
INSIDE  
SHARK  
NETS.



**2** If the shark rushes at you, face it head-on. Strike the tip of its snout, which is extremely sensitive.

STEP  
BY  
STEP



**1** If you see a shark, keep calm and swim to safety. Make smooth movements – excessive splashing mimics the fish it eats and could draw the shark closer.



**3** If the shark bites you, continue to attack its snout. Other vulnerable areas are its eyes and gills – strike or gouge them as hard as you can. Shout loudly for help.

The sea is possibly the **toughest environment for survival**. It offers no natural resources for protection against wind, rain, and sun. On the vast, open ocean, it's easy to get lost and hard to be found. You can't drink salty seawater, so carry extra drinking water, or think about how to produce it. **Plan for the worst** and be prepared with the right kit.

## MAKE A SOLAR STILL

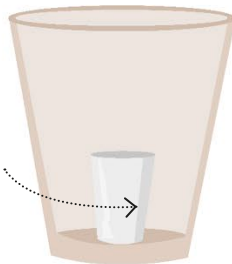
A solar still uses the sun's heat to turn salty, undrinkable seawater into water you can drink.

A sea anchor, or "drogue", keeps the boat stable and stops it drifting too far.

Catch fish with a simple hook and line attached to your paddle. Fish can be dried in the sun and stored as a food ration.

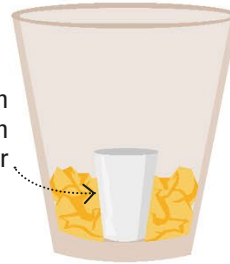
## STEP BY STEP

A cup inside a bucket



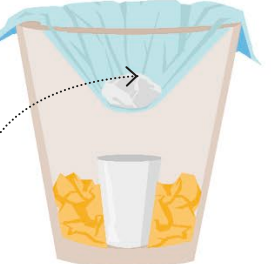
**1** If there is no rain and you don't have a desalination device (to remove salt from seawater), create a solar still. First, place a small container inside a larger one.

Cloth soaked in seawater



**2** Soak a cloth or rag in seawater and place it around the small container. The cloth should not sit too high – you don't want seawater to drip into the cup.

A stone makes a good weight.



**3** Lay a plastic sheet over the top of the larger container and place a weight in the middle. The sheet should dip down to form a cone, centred over the cup inside.



Pack an emergency survival kit box containing: whistle, flares, locator beacon, first-aid kit, drinking water, and a reverse-osmosis pump or solar still (to make drinking water from seawater).

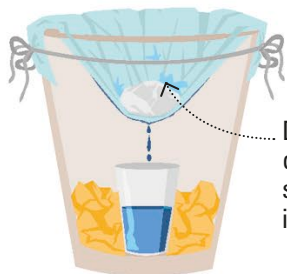
A recognition light helps rescuers spot the raft.

In the morning, soak up dew (fresh water) from the canopy with a cloth or sponge.

Collect rainwater in a bucket or bag. Catch water running off the canopy.

Solar still

Keep out of the sun, wind, and rain as much as possible. If the raft has no canopy, improvise one.



Droplets collect on the sheet and drip into the cup

**4** Secure the sheet to the top of the container with string. Make sure you can easily loosen it – you'll need to remove the sheet every few hours to re-soak the cloth.

**5** Place your still in a sunny position on the deck. As the seawater evaporates, it leaves the salt behind on the cloth. Freshwater droplets collect on the sheet and drip into the cup. The process is slow, but every drop means life.

## WARNING!



- Never drink seawater. It contains salt and will dehydrate you further.
- Dehydration is your number one enemy if you are adrift at sea (see page 101).
- Be aware that sea-sickness also leads to dehydration.

# CHAPTER 3

# CAMPCRAFT

WHETHER USING A TENT OR IMPROVISING A SURVIVAL SHELTER, IT IS ESSENTIAL THAT YOU KNOW HOW TO SELECT AND SET UP A CAMPSITE - A WELL-SELECTED SITE WILL HELP KEEP YOU SAFE.

## Under the stars

At the end of a day of walking, nothing beats a hot meal and sitting by the warmth of the camp fire.









# CHOOSING A CAMPING SPOT

When setting up your camp you should always take into account the **four principles of survival**: protection, location, water, and food. Make sure your **site is safe** and will protect you from the elements. Try to be close to a **water source**, materials needed for making a **shelter**, and fuel for a **fire**. In a rescue situation, choose a position where your location aids can be easily seen.

**DON'T PICK A SITE USED BY WILD ANIMALS OR ONE PRONE TO FLOODING SHOULD IT RAIN.**

## CAMPING TIMETABLE



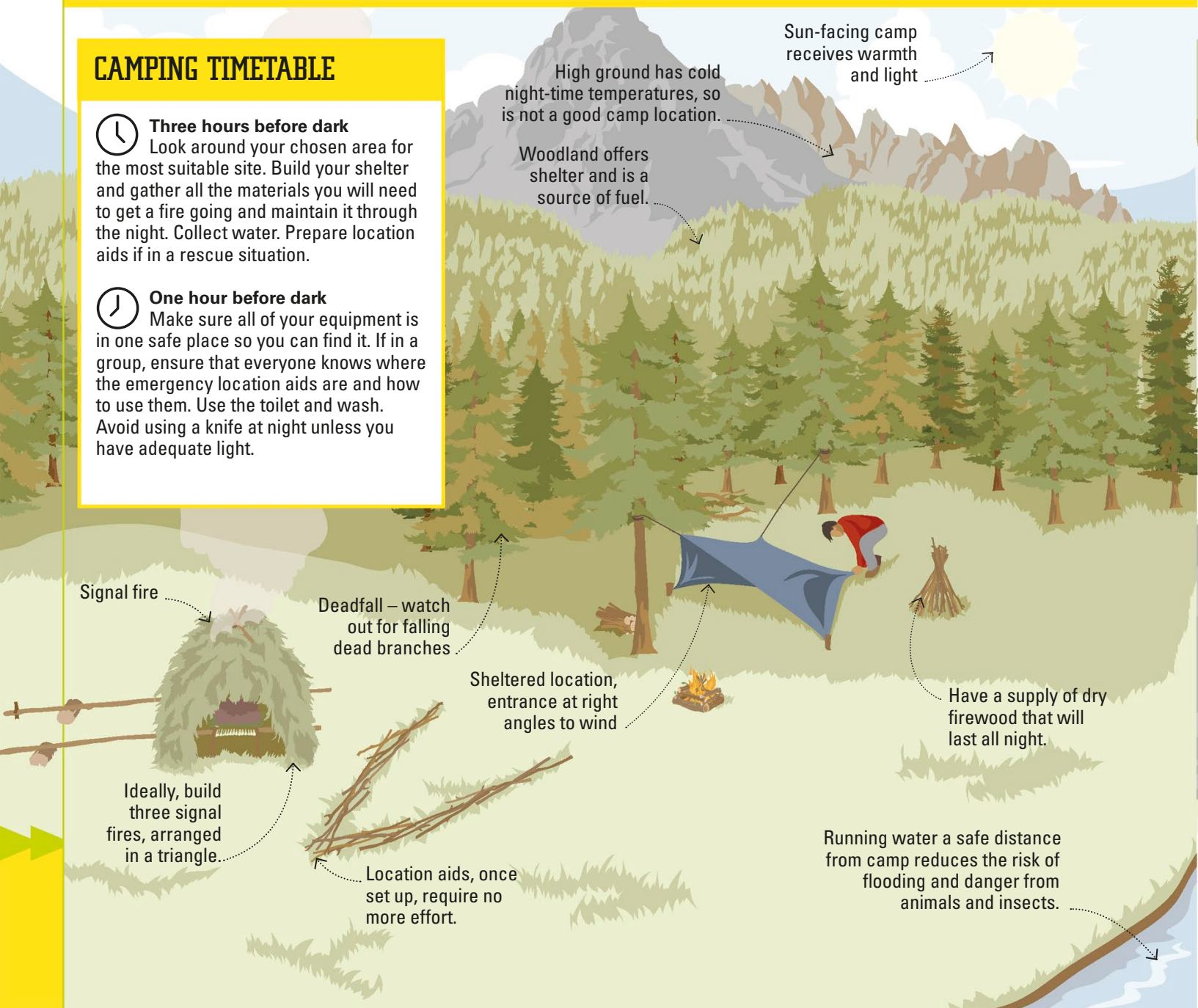
### Three hours before dark

Look around your chosen area for the most suitable site. Build your shelter and gather all the materials you will need to get a fire going and maintain it through the night. Collect water. Prepare location aids if in a rescue situation.



### One hour before dark

Make sure all of your equipment is in one safe place so you can find it. If in a group, ensure that everyone knows where the emergency location aids are and how to use them. Use the toilet and wash. Avoid using a knife at night unless you have adequate light.





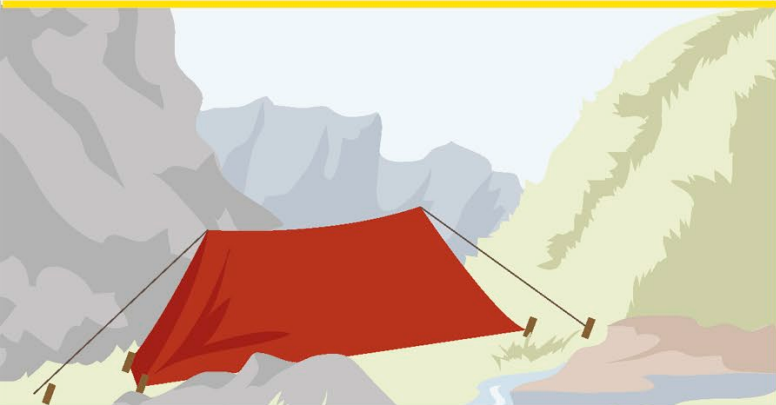
## ASSESSING THE AREA

Before setting up camp, take some time to examine your surroundings and avoid any potential hazards.

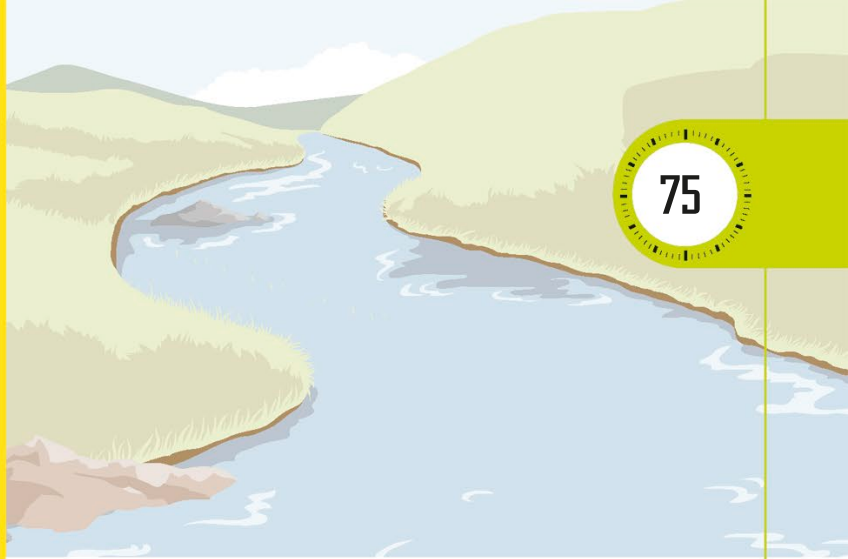
**Look for signs of animals**, especially near water, where they may come to drink. If spotted, pitch your shelter against a rock face so that it can only be approached from one direction.



**Stagnant pools** or standing water attracts swarms of insects, such as mosquitoes, which breed in them, so avoid camping next to these.

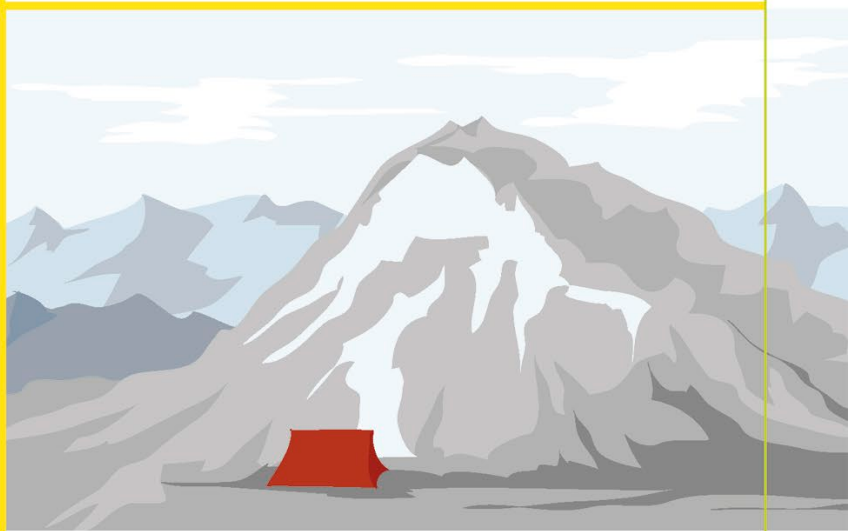


**Sloping or poorly drained ground** should be avoided as a camping spot. Also beware of rock slides and run-off from inclines during downpours.

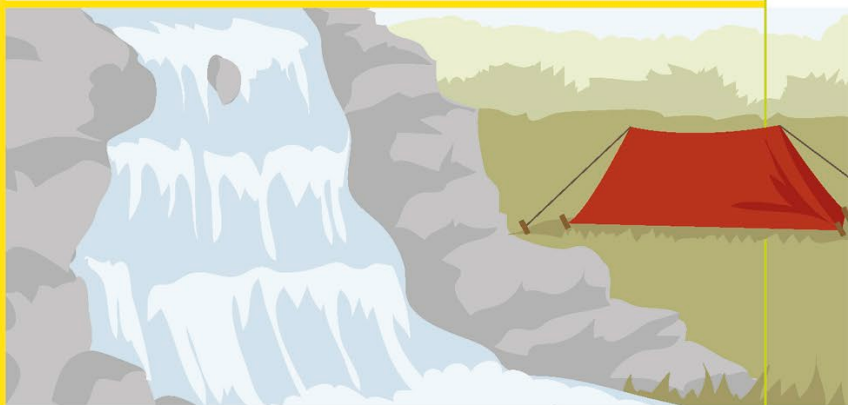


75

**Avoid areas inside river bends**, which are prone to erosion and flooding during heavy rain, as well as river banks on outside bends, which may burst. In gullies there is a risk of flash floods.



**Rockfalls and icefalls** can occur beneath mountain peaks, so check for cracks and fissures if camping near rocks. Heat rising from fires can cause rockfalls, and in the cold, ice sheets can fall suddenly from rocks.



**Waterfalls and loud running water** can be noisy enough to hide the sound of animals or rescuers, so camp away from these locations.

# TENT BASICS

A shelter gives you **immediate protection** against the elements. Some modern tents can **weigh under 2 kg** (4½ lbs) and pack to the size of a tin of beans! Most modern tents use a **flexible pole system**, have **separate flysheets**, and are easy to erect when using instructions.

**ALWAYS USE A WATER-PROOF GROUND SHEET IN WET CONDITIONS.**

## PUTTING UP A TENT

Always practice putting up your tent before going camping, ideally both during the day and in the dark.

In dry, hot weather, you may not need the flysheet.

A taut flysheet allows rain to run off and not pool on the tent.

**3** Secure the flysheet over the inner tent, leaving a gap between them to prevent moisture on the flysheet from leaking inside. Peg the flysheet taut.

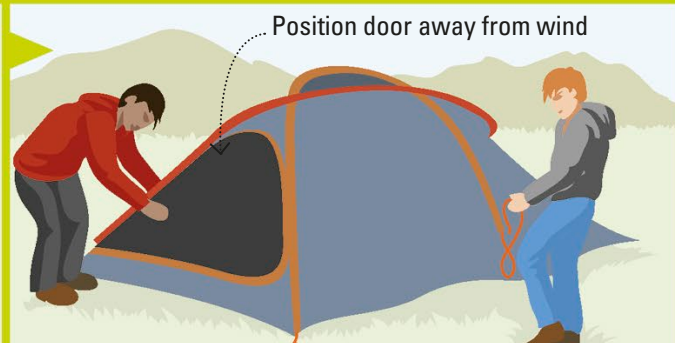
Loop the guyline around the peg and drive the peg into the ground. Adjust so the guylines are taut.



## STEP BY STEP



**1** Place your groundsheet flat on the ground and lie on it to check there are no stones or roots underneath. The groundsheet should not extend beyond the floor of the tent.



**2** Most tents have a pole and sleeve inner tent, and a separate flysheet. Erect the tent, position it over the groundsheet, and peg it into place using the loops around the edges.



## MAKE A TENT PEG

Use wood from green trees when making tent pegs. Never use wood found on the ground – it could be rotten.

### WARNING!



Never drive a peg into the ground with your foot. If you misjudge it, the peg may injure your ankle or foot. Use a stone or a heavy stick as a mallet instead.

**1** Choose a piece of wood 22.5 cm (9 in) long and 2.5 cm (1 in) wide. Hold it steady, with the end you want to make into a point firmly on the ground.

**2** Using your knife, shave off the wood in a downwards motion, pointing the sharp knife edge towards the ground. Slowly shave until you have a point at the end.

**3** Cut a notch towards the top of the peg. This will help your tent's guylines stay securely around the peg.



77

## TIE A HANK

Keeping cordage – here paracord – in a hank stops it becoming a big ball of knots that you have to unpick later.

### WARNING!

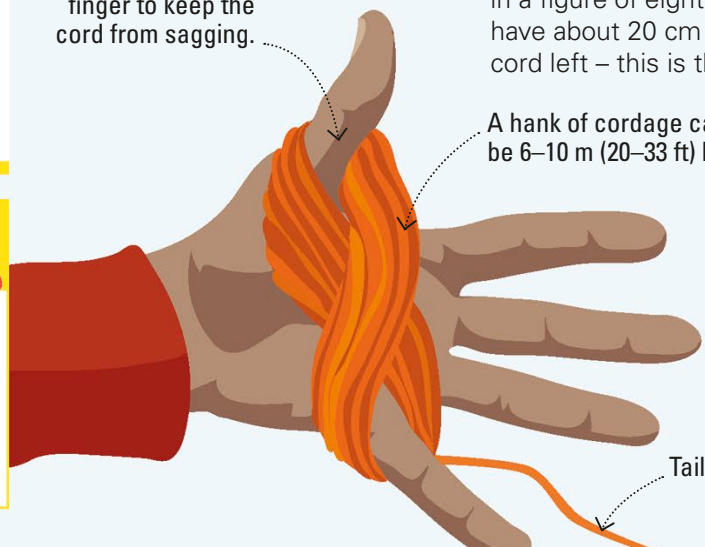


If you want to heat-seal the end of the paracord, do be careful if heat-sealing over a flame – when the paracord melts, it can drip and burn.

Stretch out your thumb and little finger to keep the cord from sagging.

**2** Continue winding the cord in a figure of eight until you have about 20 cm (8 in) of cord left – this is the tail.

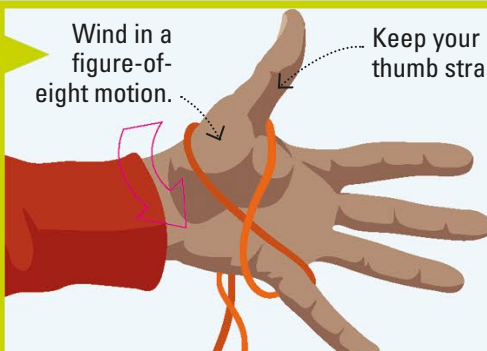
A hank of cordage can be 6–10 m (20–33 ft) long.



## STEP BY STEP

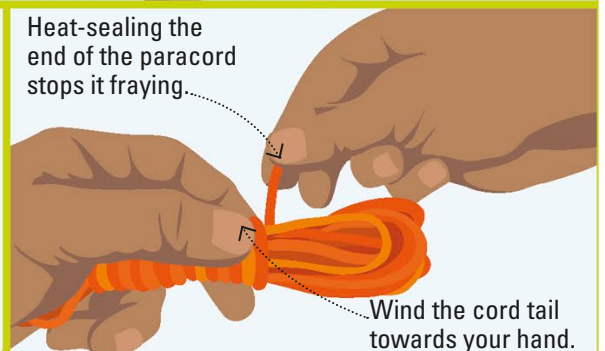
Wind in a figure-of-eight motion.

Keep your thumb straight.



**1** Hold out your hand with your thumb and fingers spread out. Rest the end of the cord on your palm, then loop the cord in a figure of eight around your thumb and little finger.

Heat-sealing the end of the paracord stops it fraying.



**3** Take the hanked cord off your thumb and little finger. Secure the hank by winding the tail tightly around it. Finish by tucking a loop under the last wind and pulling it tight.

In a **survival situation** you may need to spend a period of time **in one place** – maybe you **cannot move**, or staying where you are is the best option for **rescuers to find you**. Following some **simple rules** will help to ensure that when you set up a site, even for just one night, **you will remain safe** and won't put yourself or others in any more danger.

**RESCUE TEAMS MAY BE IN THE AIR OR ON THE GROUND. LOCATE A SITE THAT BOTH CAN SEE.**

## FIRE AND FUMES

Fire safety around your camp is extremely important – out of control fires can be devastating and fatal.

Have a means of extinguishing your fire quickly – water, sand, or soil work.

Keep your fire a safe distance away from low, overhanging trees, and your shelter.

- 
- ✓ Keep watch on your fire at all times.
  - ✗ Don't leave the campsite until the embers are cold to touch.
  - ✗ Don't position fire where smoke can pour into the tent.
  - ✗ Do not have a naked flame (candles, cooking stoves, barbecues) inside your shelter/tent. This can result in a build-up of toxic carbon monoxide gas – which you can't see, hear, smell, or taste.
  - ✗ Do not use accelerants (petrol, gas, methylated spirits) to start your fire – their vapour is invisible and can explode when ignited.
  - ✓ Do keep the area around your fire clear and free from tripping hazards.



## GOOD HOUSEKEEPING

A well organized site keeps you safer and ensures everyone knows where everything is stowed.



79

- ✓ Designate areas for tools, emergency signalling devices, and other important items – so everyone knows where they are and can get to them easily and safely.
- ✓ Pack away items not in immediate use – they are less likely to get lost.
- ✓ Keep important equipment inside your shelter, where it will keep dry.
- ✗ Do not set up toilet facilities too close to your camp, but DO make sure the loo is easy to locate in the dark (see pages 90–91).
- ✗ Do not leave possessions out in the open after dark – they'll get wet if it rains or dew falls in the night.
- ✗ Do not cut firewood once it gets dark – even cutting firewood by torchlight can be dangerous.

## KEEP OUT!

Whilst you should have picked a site safe from wild animals, you should still do all you can to not encourage a visit.



Bears, rats, mice, and other creatures may trespass into your campsite on their hunt for food.



### DO'S

- ✓ Keep food away from your site, off the ground, and in animal-proof containers.
- ✓ Hang up your boots on a post and keep clothes packed away to keep out insects.
- ✓ Check for stinging or biting insects by shaking out clothes and sleeping bags, and by tapping out boots before putting them on.
- ✓ Always keep the tent zipped up to prevent animals entering.



### DON'TS

- ✗ Don't reach into concealed spaces, backpacks, sleeping bags, or boots, without checking – small animals, spiders, or snakes may have crawled in!
- ✗ Don't leave dirty cooking or eating utensils around after eating – they attract scavengers, so clean immediately.
- ✗ Don't prepare or cook food close to your tent, as it can attract animals.
- ✗ Don't leave your torch on if not needed – the light attracts unwanted insects.

# TYING KNOTS

Before you set off on a trip, learn the best **knots** for **particular tasks**, such as attaching a line to a tree, and **practise** tying them. Skill with knots is not only useful but saves wasting cordage. Usually, a correctly tied knot **unties easily**, so you can **re-use the same cordage** many times.

## The ends of the line

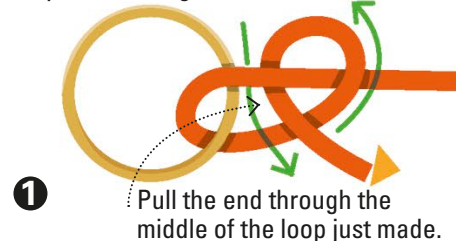
The end doing the least work is called the standing end.

The end you actively use to make the knot is called the working end.

## Half hitch

A single half hitch knot is unsafe when used alone but holds firmly when doubled or trebled. It is often used to make another knot more secure.

Put the line through the fixture, loop the working end over the line.



For a double half hitch, again loop the end over the line and pull through the middle of the new loop.



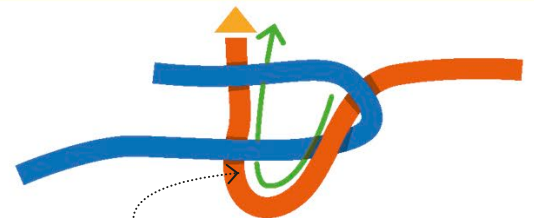
## Reef knot

The reef knot (or square knot) is good for securing a line around an object or joining two lines together. Do not use it for jobs that need a secure knot, as it can work itself apart.

1 Form a bight with the end of the standing line.



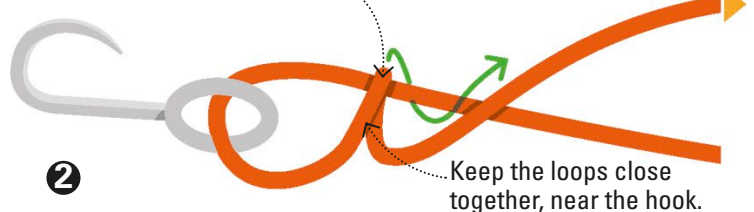
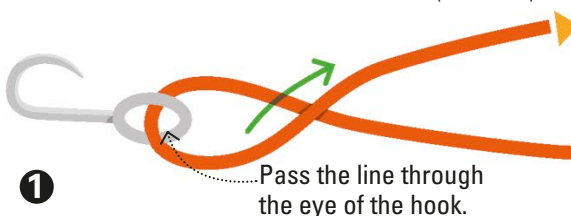
2 Pass the end of the working line through the bight and around both parts of the standing line.



## Fisherman's knot

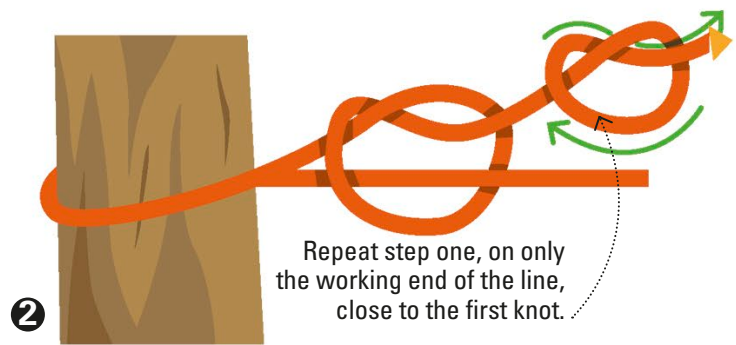
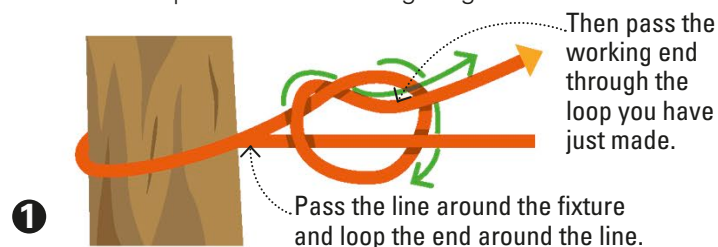
This easy and reliable knot is used for tying hooks to single-fibre (monofilament) fishing line. It does not work well with a multi-stranded (braided) line.

Loop the working end over the line, winding it round 5–6 times.



## Arbor knot

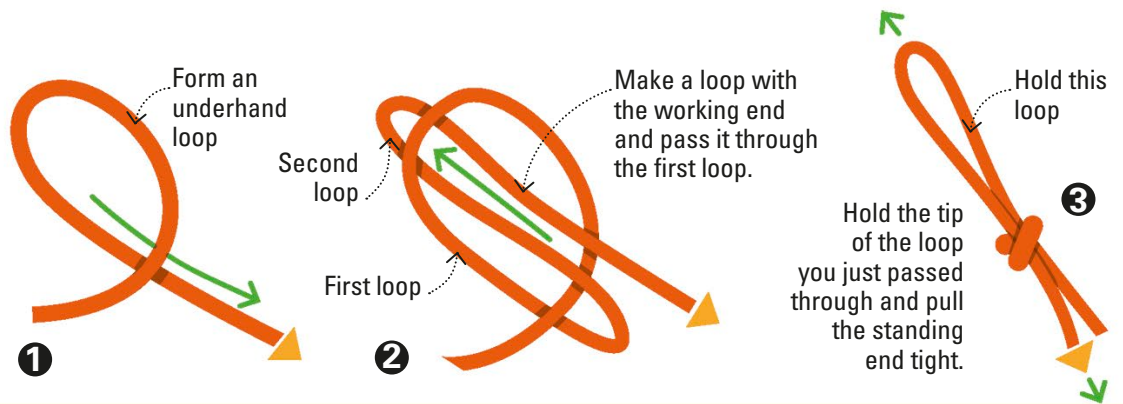
Use this all-purpose knot to tie the end of a line to a fixed point or to lash things together.





### Slip knot

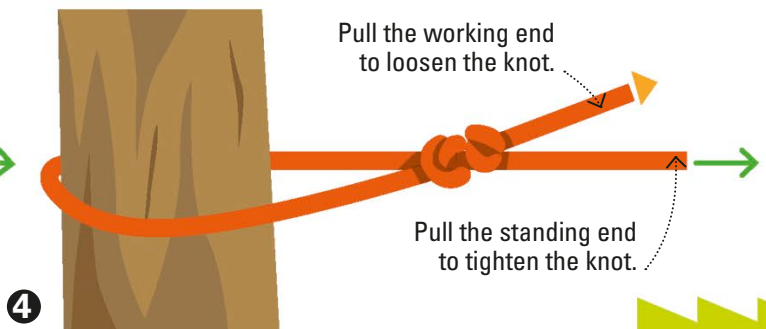
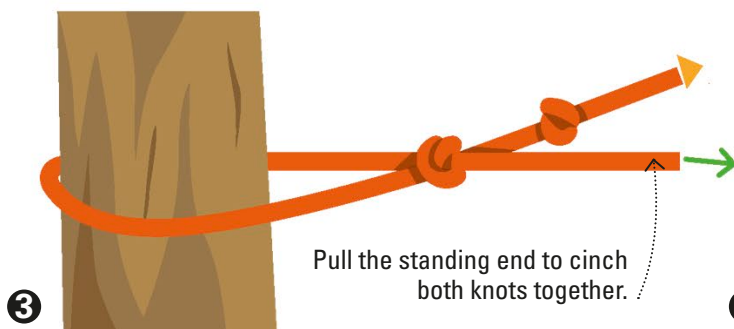
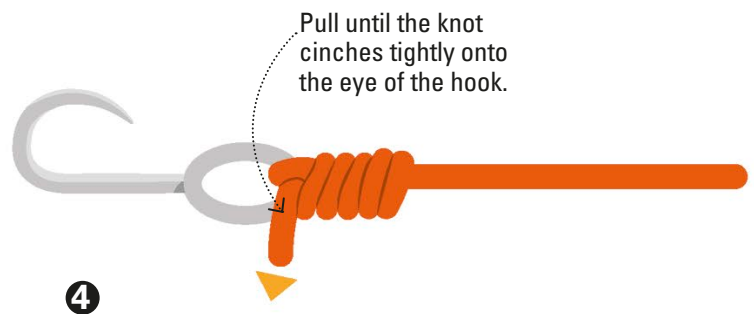
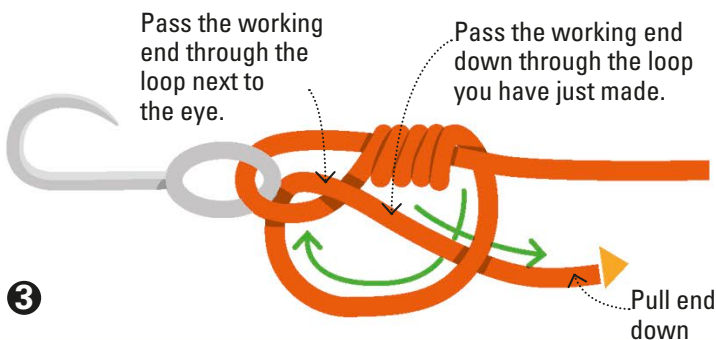
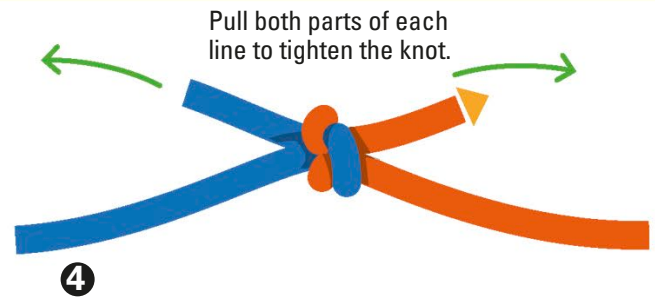
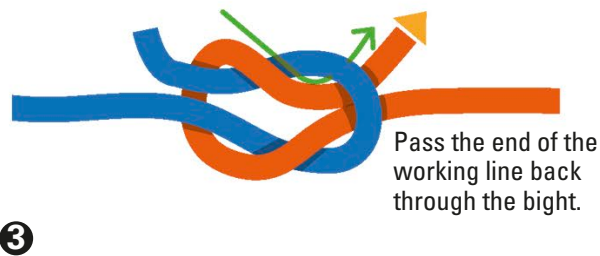
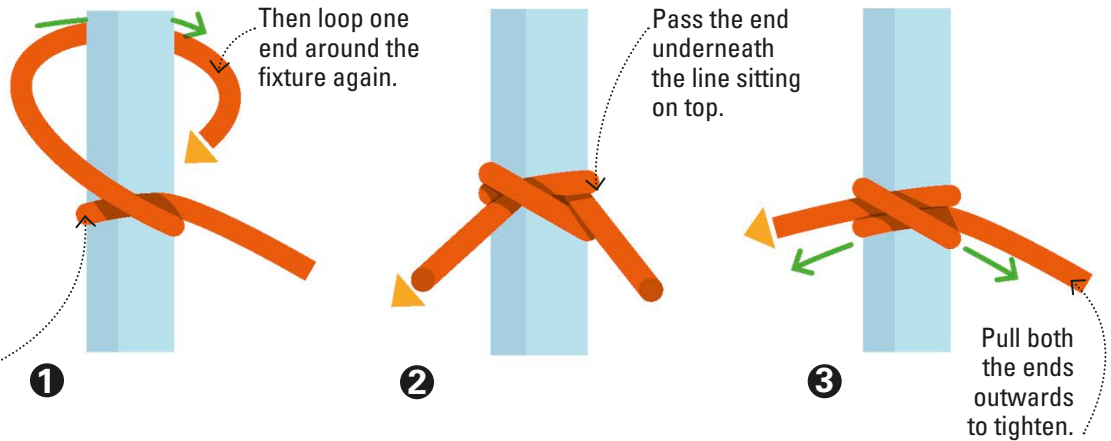
A slip knot is a great example of a simple knot that has many practical uses. One end tightens and one end loosens. Pull both ends to undo completely.



### Clove hitch

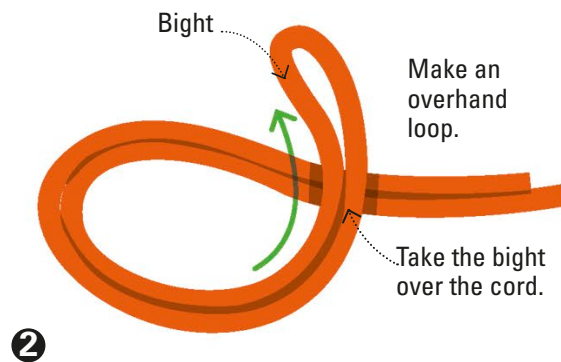
This handy knot is simple to tie and untie. A clove hitch can slip if not under constant pressure, so combine it with two half hitches for more security.

First, place the line around the fixture.



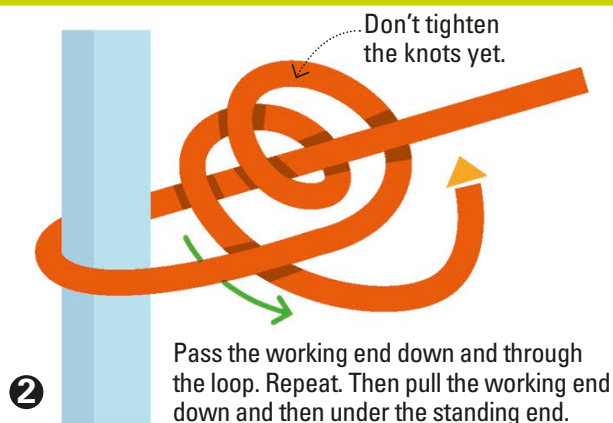
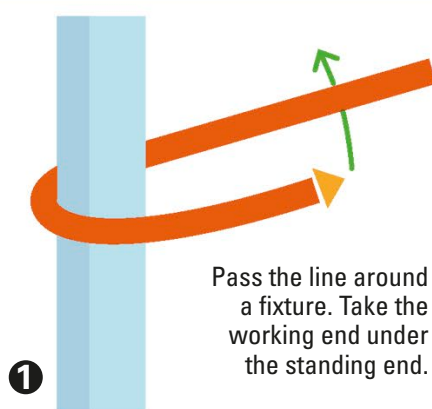
### Overhand loop knot

This knot is used to quickly and easily form a fixed loop at the end of a cord, or anywhere along a cord. The overhand loop is difficult to untie once pulled tight.



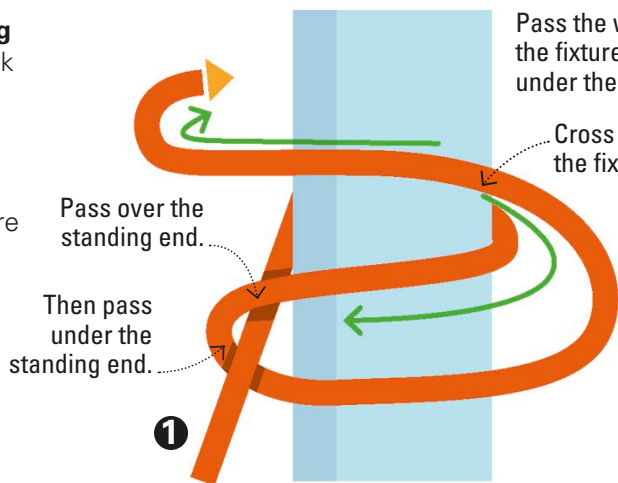
### Taut line hitch

Widely used as a sliding knot, the taut line hitch holds fast when under strain but is easily adjustable. It is excellent for guylines on tents and shelter sheets.



### Double chain fastening

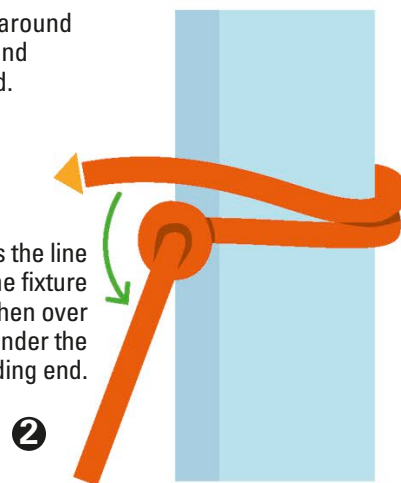
Also called the hammock knot, the double chain securely attaches the free end of a line to a fixed point. The more turns you make, the more secure it becomes. The fastening loosens easily when not under strain.



Pass the working end around the fixture, then over and under the standing end.

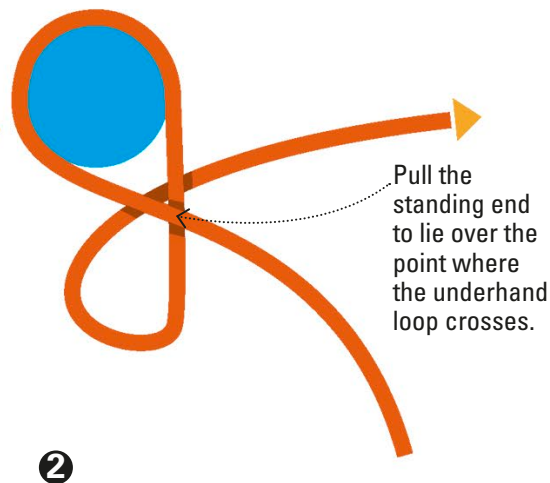
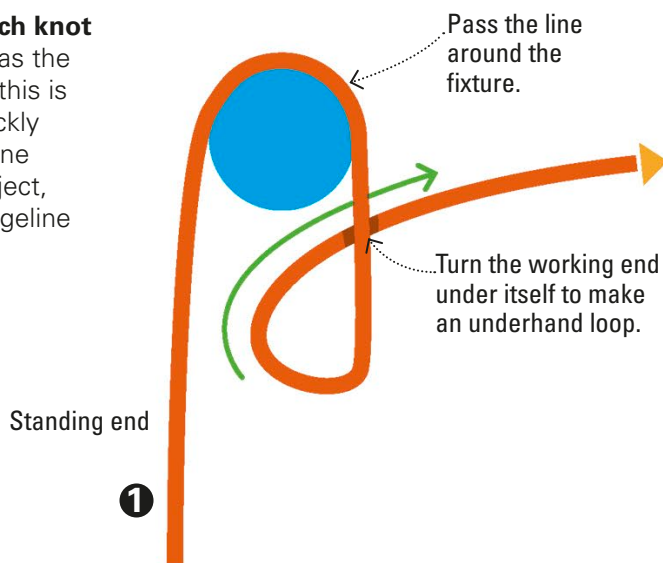
Cross in front of the fixture again.

Pass the line behind the fixture again, then over and under the standing end.



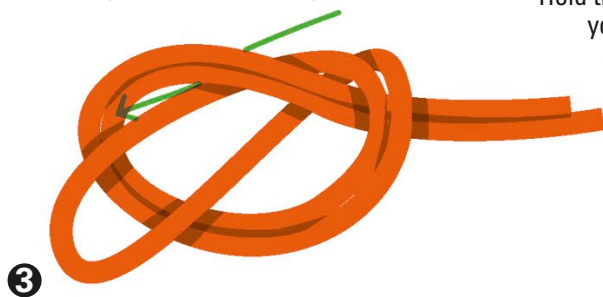
### Siberian hitch knot

Also known as the Evenk knot, this is good for quickly attaching a line to a fixed object, such as a ridgeline for a shelter.





Pass the end of the bight up through the loop to form a new loop.



Hold the loop as you pull the other end.

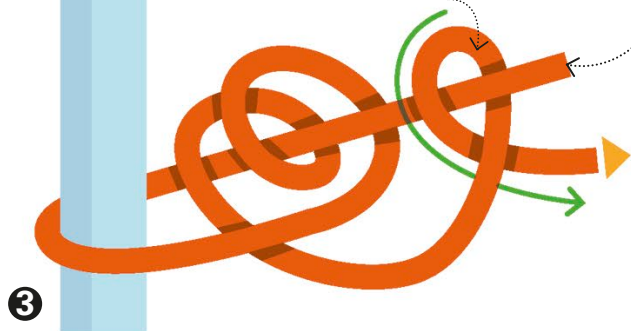
Adjust the loop to the size you need.



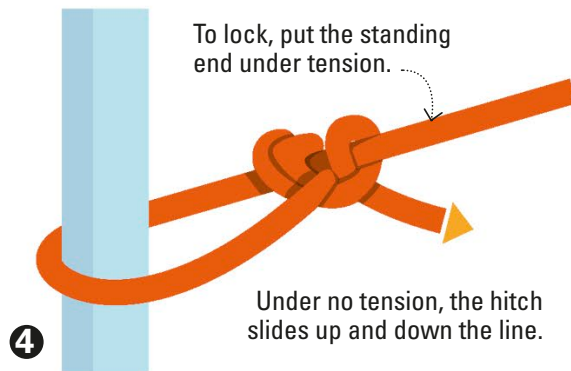
83

Pull here to tighten the knot.

Take the working end back over the standing end, and through the loop to make a second knot.



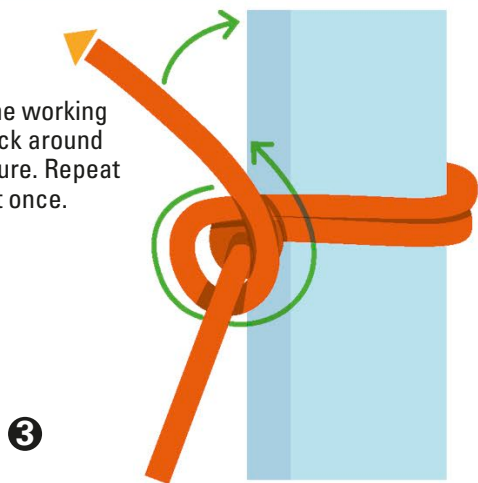
Then, pull the standing end to tighten the hitch.



To lock, put the standing end under tension.

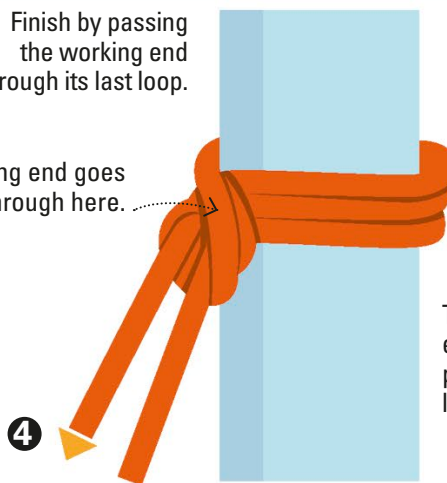
Under no tension, the hitch slides up and down the line.

Pass the working end back around the fixture. Repeat at least once.



Finish by passing the working end through its last loop.

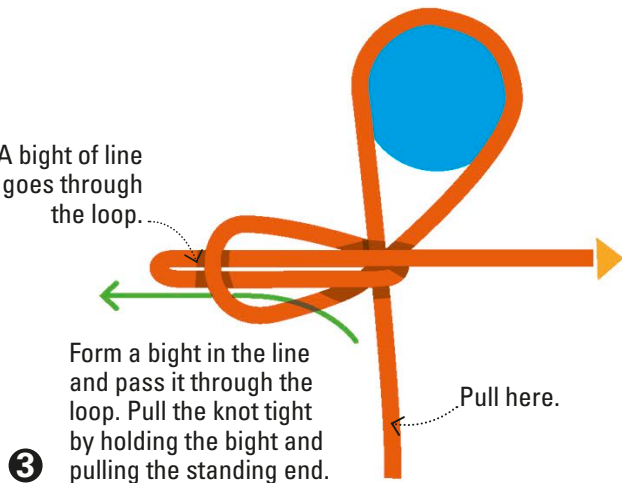
Working end goes through here.



To undo the knot easily, release pressure on the last loop made.

A bight of line goes through the loop.

Form a bight in the line and pass it through the loop. Pull the knot tight by holding the bight and pulling the standing end.

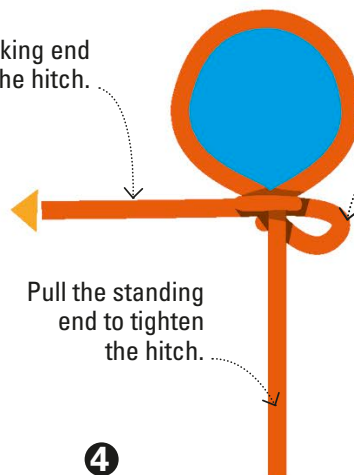


Pull here.

Pull the working end to undo the hitch.

Pull the standing end to tighten the hitch.

The loop flips over as you tighten the hitch.



# NATURAL SHELTER

A shelter is your **primary protection** against the elements when in a survival situation. Even a **basic shelter** can help **protect** you from the **sun, wind, rain, and cold** and give a sense of safety. A shelter can be made from what you have with you, or what nature offers.

**BUILD FOR THE WORST CONDITIONS. IT MAY BE DRY WHEN YOU START BUT MAY RAIN LATER.**

## CAVE SHELTER

These are ready-made shelters, but check for animal signs, avoid going in too far, and be aware of air quality.

A wall of stones reflects heat into cave

Small fire towards the back of the cave keeps exit clear

Use dry wood to reduce the amount of smoke

## BEDDING

You will always have a warmer and more comfortable night's sleep if you can sleep off the ground.

### BEDDING TIPS

- Feathers are the best bedding as they keep warmth but not moisture.
- Try pine and spruce boughs, dry leaves, moss, bracken, and grasses.
- Get twice as much material as you think you'll need.

**1** Peg out long logs to form a bed area.

**2** Use wooden pegs to keep the logs in place.

**3** Fill the inside with lots of dry materials – 15 cm (6 in) of dry leaves will compress to 5 cm (2 in).





# HOLLOW SHELTER

Constructing a simple roof over a natural hollow can provide a quick and easy shelter.

Lattice should be dense enough to stop the final layer falling through gaps.

Height of roof retains shelter heat and slope helps the water run off

Log lies on the branches lengthwise, across the hollow's centre

85

Latticework of branches are crossed and reach over the top of the log.

Sturdy branches are laid transversely across the hollow.

Leave a gap for an entrance, not facing the wind.

**3** Use dry, dead wood or branches to form a basic latticework pitched roof.

## STEP BY STEP



**1** Find a dry natural hollow. You can deepen the hollow using a digging stick, or, if the ground is too hard, stack logs to make sides. Lay out bedding.



**2** Place sturdy branches across the hollow. Set a log on top of the branches to form a central ridge. Tie the log to a couple of the branches to make it sturdier.



**4** Add layers of foliage to insulate. Layer from the outside to the centre. In wet conditions you can also secure a shelter sheet over the top.

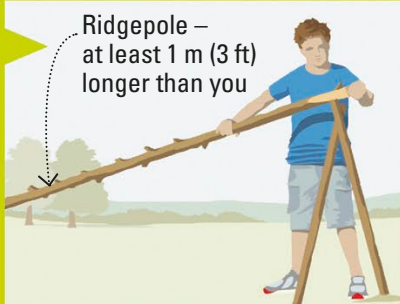
# A-FRAME SHELTER

If you have the natural materials available, an **A-frame** shelter can provide excellent protection in which it is relatively easy for you to keep warm. However, they do require some effort to build. Remember to re-cover your shelter after every night.

**USE WOOD THAT'S  
FALLEN, BUT NOT  
ROTTEN, INSTEAD  
OF CUTTING  
DOWN TREES.**



## STEP BY STEP



**1** Use a saw to smooth one side of a ridgepole. Hammer two poles into the ground to form an A. Rest one end of the ridgepole on the A, with the other end on the ground.



**2** Lay poles against branch stubs on the ridgepole, or tie them to the ridgepole with an arbor knot (see pages 80–81). Digging the pole ends into the ground makes it sturdier.



## TREE SHELTERS

Constructing other shelters is great fun. Remember the aim is to stay safe, warm, and dry. Use the methods learned in the building of the A-frame shelter to make tree shelters from broken, uprooted, and fallen trees.



### Broken trunk

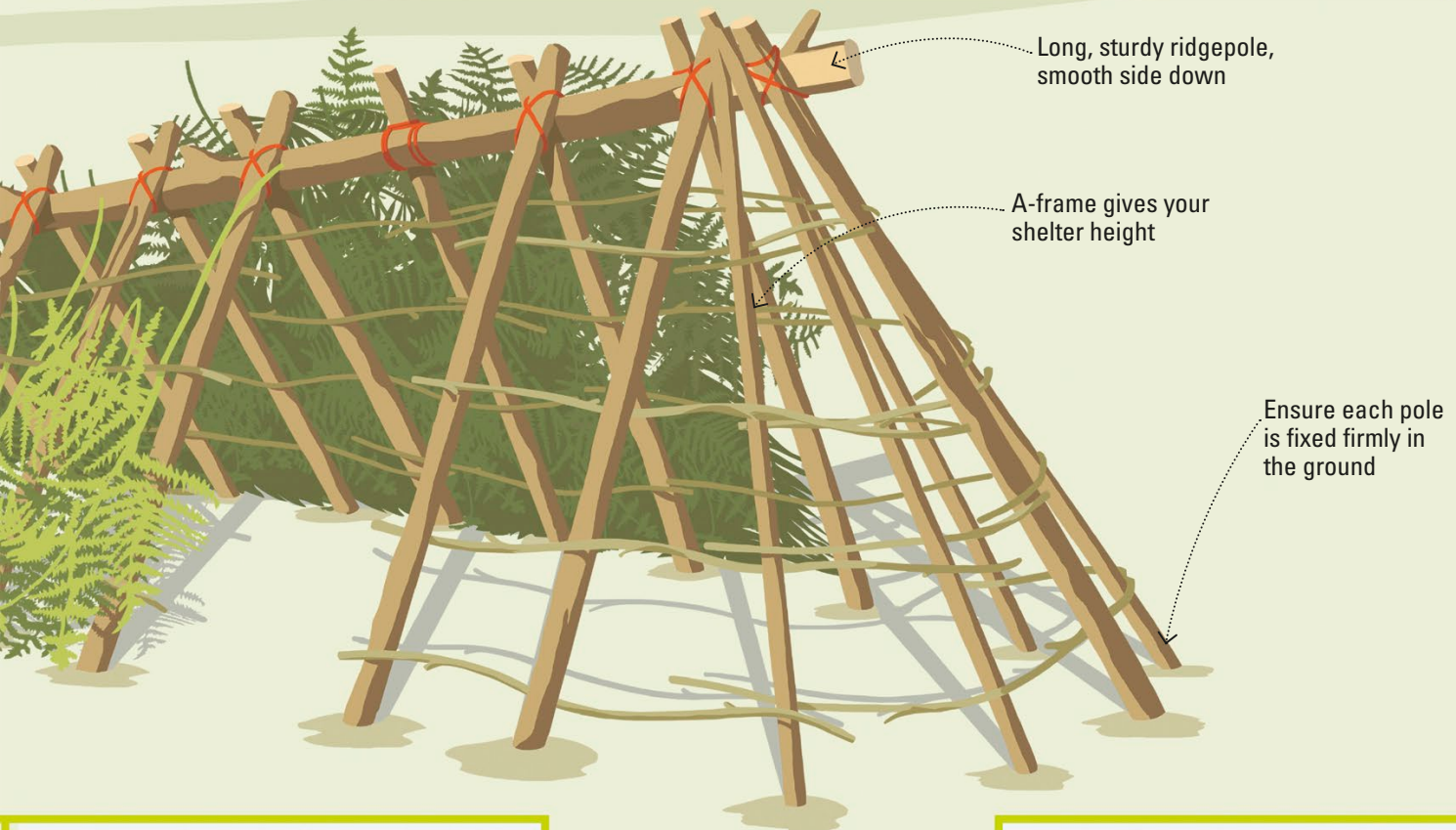
Tie off a ridgepole to a tree instead of using an A-frame at the front.

### Uprooted tree

Build a roof over the higher roots and hollow at the base of an uprooted tree.

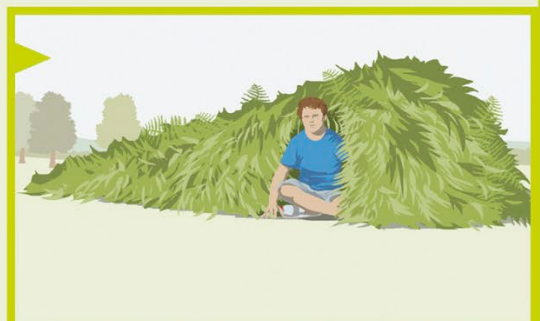
### Fallen tree trunk

Use the side of the tree trunk to build a roof – like one side of the A-frame shelter below.



- 3 Weave rows of saplings horizontally through the poles to form a latticework, leaving a gap for your entrance. Ensure the entrance is large enough for you to get in.

- 4 Cover the latticework frame using whatever natural materials are available. Pine boughs or anything with a large leaf, such as ferns, work well.



- 5 After covering the latticework, add a second layer of leaves and moss. The first layer will stop the second one from falling through.

# MAKE A TARP SHELTER

In a survival situation you need **immediate protection** from the elements as being cold and wet can quickly and seriously affect your ability to function. Packing a **space blanket, tarp, shelter sheet, or poncho** means you have the ability to quickly make a simple shelter and get out of bad weather.

KNOTS - SEE PAGES 80-83



Angle pegs at 40 degrees from shelter.

Pile vegetation such as leaves around the base of shelter to keep out wind.

Siberian hitch knot

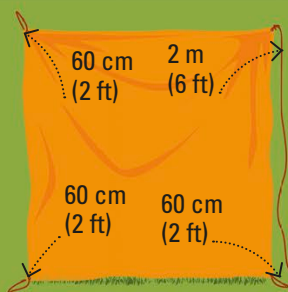
You can use your backpack to form a partial door.

## ONE-POLE SHELTER

A one-pole shelter uses cordage and a stick to make a basic shelter from the wind and rain.

- 4 Find a long stick about 1 m (3 ft) for a centre pole and place it inside the middle of the shelter to give height and keep the sides taut. Cushion the spot (by using a spare sock, for example) where the pole meets the sheet so it doesn't tear through.

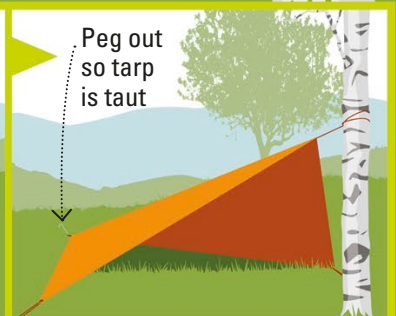
## STEP BY STEP



- 1 Cut 3 x 60-cm (2-ft) cords. Pass each one through a corner and make a loop with a reef knot. Cut a 2-m (6-ft) cord and tie to the last corner with a Siberian hitch knot.



- 2 Tie the long cord on the fourth corner to a tree at a height of 1 m (3 ft) off the ground with another Siberian hitch knot.



- 3 Making sure the opening to the shelter faces away from the wind, peg out the other three corners.



## OTHER SHELTERS

While the one-pole shelter is the easiest to improvise, there are other quick shelters that you can make. Practise building these shelters, so that it becomes second nature. If you have a little more room in your backpack, carry a bothy bag – a basic emergency shelter that is ready to use and will protect you from the elements.



### A-frame

Tie cord between two trees with a double-chain knot. Drape over a tarp to create an A-frame. Attach cord loops (see Step 1, opposite) to peg it out.



### Hoop shelter

Form three hoops from saplings or softwood trees and peg out the corners of your tarp or poncho over them.



### One-sided shelter

Attach one side of a tarp to a line between two trees and peg the other end to the ground at an angle. This will form a basic wind break.

## MAKE A BUTTON TIE

If your shelter material has no loop or grommet to which to attach a line, make a button tie. This makes a secure fastening without cutting holes in the material, keeping it waterproof and less likely to rip.

Stone inside the material

**2** Place the open loop of the slip knot over the neck of the button and pull it tight.

### STEP BY STEP



**1** Wrap a small, round, smooth stone in the material to form a "button." Prepare a length of cord with an open loop of a slip knot at one end.



**3** At the other end of the cord, make a simple overhand loop to place over your shelter pegs.

Personal hygiene when outdoors is very important. Keeping yourself clean helps to **keep you healthy** by reducing the risk of infection, sores, and illness. It is also important to a positive **state of mind** – when hygiene slips, often everything else follows!

## POO IN THE WILD

In a survival situation, or just out in the woods, you may get caught short. Here is the right way to poo outdoors.

**2** Remove your trousers and pants or have one leg out. If in a skirt, keep it gathered above your hips. Squat over the hole, and hold the tree for support while you take care of business.

Grip a tree to help you balance.

Always carry travel tissues and hand sanitizer.

## STEP BY STEP

**1** In a private spot, clear a 1-ft- (30-cm-) square area an arm's length from a tree. Use a stick to dig a hole, piling soil beside it. Put toilet paper and sanitizer nearby.

**3** With the business done, you can now stand up. Before doing anything else, wash your hands using sanitizer or water. You can now sort your clothing.

**4** With your stick, use the pile of soil to entirely cover the toilet hole. Place two crossed sticks on top of the area, so others know that this spot has been used.



# MAKESHIFT SHOWER

You can buy camping showers, but if you have an empty container or spare bucket you can make one easily.

91



- 4** Hook the shower over a bowed sapling or a low branch. Fill with water warmed over a fire or left to warm in the sun. Be careful not to let the water become too hot.

## STEP BY STEP



- 1** Turn the container upside down on a flat surface. Then carefully punch holes in the bottom with the point of your knife or a nail.



- 2** Make a hole about 2.5 cm (1 in) down from the rim of the container. On the other side make a matching hole. Use a rock to smooth out any rough edges.



- 3** Thread cord more than 60 cm (2 ft) long through the holes so about 30 cm (1 ft) is on either side. Tie the ends with an overhand knot (see pages 82–83).

## DAILY HYGIENE

Check for ticks and insects. Avoid fungal infections by washing every day. Your hair will regulate itself.



**Rinse eyes** with water twice a day.



**Check head** for insects and bites.



**Rub teeth** and gums with a clean finger.



**Wash hands, feet, crotch, and armpits.**

# USING A POCKETKNIFE

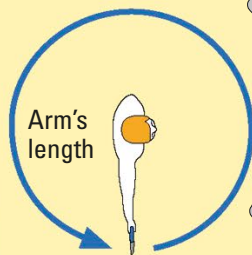
A **pocketknife** and a **small saw** can be the most useful items to have in your **survival kit**. Knowing how to **use a knife and saw safely** will reduce the likelihood of injuring yourself or others. A pocketknife has many uses, from **cutting cordage and twigs** to **preparing food**.

**DON'T USE A KNIFE UNTIL YOU HAVE BEEN SAFELY TAUGHT HOW.**

## KNIFE SAFETY



- When using a knife make sure everyone around you is aware you have an open knife. Keep a clear and safe working circle (shown below), making sure there are no hazards within your arm's length.



- Always keep your knife closed unless you are actually using it. Use a solid base to support your work – such as the ground. Never use a part of your body, such as your thigh, to support your work.
- Always cut away from yourself.

## OPEN AND CLOSE A KNIFE

**OPEN** Hold the knife in one hand, with your thumb along one side and your other fingers along the opposite side. Use the thumb and index finger of the other hand to open the blade away from you until it clicks into place.

**CLOSE** Hold the knife in the same way as when you opened it. Pinch the back of the blade with your thumb and index finger, then slowly fold the blade fully back into the body of the knife.



## WARNING!



**In the UK, it is illegal to:**

- Sell a knife to anyone under the age of 18, unless it has a folding blade that is 7.62 cm (3 in) long or less.
- Carry a knife in public without good reason, unless it has a folding blade with a cutting edge that is 7.62 cm (3 in) long or less.
- Carry, buy, or sell any type of banned knife.
- Use any knife in a threatening way (even a legal knife).
- Carry a knife or tool with a blade that locks.

## KNIFE CARE



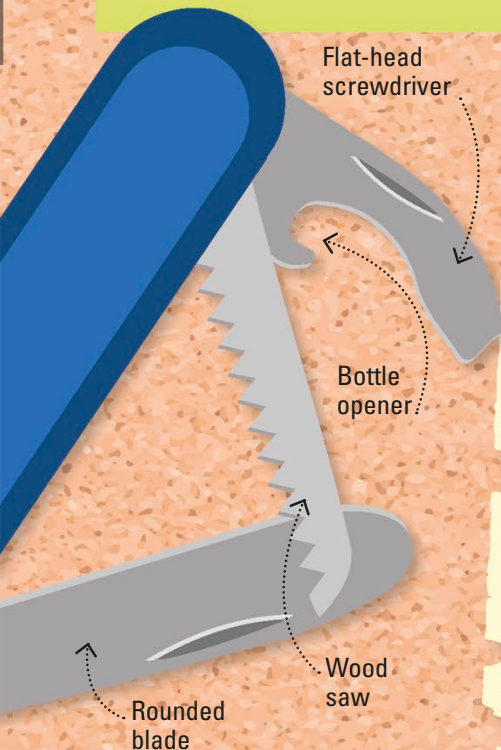
- ✓ Ask an adult to always keep your blade sharp, as a sharp knife is safer than a blunt one.
- ✓ Clean your knife after use and make sure it is dry before storing away.
- ✓ Lightly oil the blade and any moving joints.
- ✓ Keep your knife in a sheath or pouch on your belt.



## WOOD SAW BASICS



- Always make sure the wood you are to saw is securely held against a solid surface, such as a flat rock or log.
- Use your foot or hand to keep the wood steady whilst you saw.
- Make sure you wear shoes for protection when using your foot to hold the wood in place.
- Keep your hands a safe distance from the saw blade, as it might slip.



### HOLD A KNIFE

Always hold the knife with a firm but relaxed grip. Positioning your grip close to where the handle joins the blade reduces strain on the wrist.



### HOW TO CUT WITH A SAW

Using the wood saw blade is a safer way to cut wood and it uses less energy than cutting with a small knife. Saw blades are extremely sharp, so always keep your fingers away from the teeth. Cut on a solid surface and make a starting groove before applying pressure. You can use your foot to help secure the piece being cut, but wear protective footwear.



ALWAYS PAY ATTENTION WHEN NEAR A KNIFE

93

### DO'S

- ✓ Always close your knife before handing it to someone else.
- ✓ When using a knife always have a first aid kit at hand.
- ✓ Always cut away from yourself and others.
- ✓ Wearing gloves can give an extra layer of protection.
- ✓ Do all of your cutting in daylight, when you can see what you are doing safely.

### DON'TS

- ✗ Don't throw your knife – it is extremely dangerous and can also damage your knife.
- ✗ Never stick your knife in the ground when not using it – always put it back in its sheath.
- ✗ Don't use a knife with cold or wet hands, or when tired.
- ✗ Don't throw your knife at a tree – it can bounce straight back at you!
- ✗ Don't use a knife in the dark, or under torchlight or candlelight.

# MAKING A FEATHER STICK

The **three material elements** you need to build a fire are **tinder, kindling, and fuel**. They must be dry and plentiful. A well-made **feather stick** effectively provides all three elements on one piece of wood. It can be lit easily with a match or lighter or even from a **spark**, with practise. Making them is good fun.

The "feathers" act as tinder. Other sources of tinder include birch bark, dry grass, and fine wood shavings.

KNIFE SAFETY - SEE PAGES 92-93



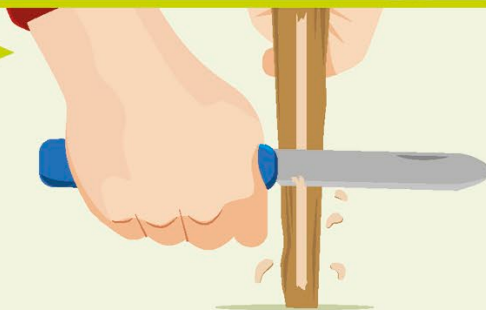
The thin part of the stick is kindling. Small, dry, dead pieces of wood, as thin as a match or as thick as your finger, are used to get the fire going.



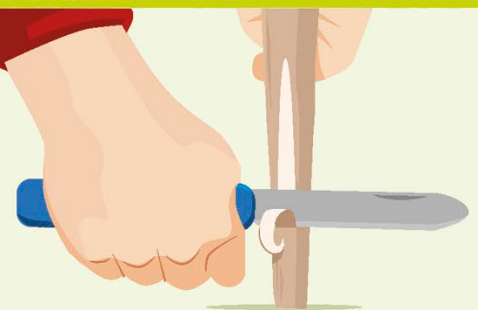
The end you are holding is the fuel. Dry, dead fuel creates a bed of hot coals that sustain your fire with little effort. Additional fuel logs should be about as thick as your forearm.

**3** Turn the stick and run the knife down the edge to create a second shaving, then keep working around it until you have a thin stick with curled shavings attached.

## STEP BY STEP



**1** Choose a straight, dry stick with no knots. Lay your blade flat on the stick and run it all the way down the stick, trying not to cut into the wood at first. This helps you feel how your blade moves over it.



**2** Tilt the angle of the blade towards the wood and run it down to cut a shaving, stopping just before the bottom so that the shaving stays attached to the stick. Don't worry if at first you cut the shaving off.



# MAKING SPARKS

95

**Lighting your tinder** is the first step to making a fire. **Matches** or a **lighter** do this easily, but being able to light tinder using a **spark** is a great skill! A **flint and steel** – a ferrocerium or magnesium alloy **rod** combined with a steel **striker** – is waterproof and produces thousands of sparks.

Blowing gently on the flames adds oxygen.



For fire safety, see page 78

Place your ball of tinder on a fire platform.

**4** Keep making sparks until the tinder has caught fire – ensure you remove your hands and feet away from the flames immediately. Make sure you have lots of kindling and fuel ready to add – at least twice what you think.

Use your boot to hold the hand that is holding your striker steady.

## STEP BY STEP



**1** Gather your tinder, kindling, and fuel (or feather stick, opposite). Place a ball of tinder on your fire platform and place the end of the rod in the centre of the tinder.



**2** Place your striker onto the rod and lock the hand holding the striker in position. Resting your hand on your boot helps.



**3** Pull the rod up and away from the tinder, drawing it against the striker to make sparks. Drawing it up avoids disrupting your tinder.

# HOW TO BUILD A FIRE

The importance of being able to **make and maintain a fire** cannot be understated. Fire can keep us **warm, dry, and safe from wild animals**. Fire can also be used to **boil water**, so it's safe to drink, and to **cook food**. We can use fire to **signal** for help, too. Things never seem so bad when you are sitting in front of a fire.

**CARRY TWO METHODS OF LIGHTING A FIRE - AND KNOW HOW TO USE THEM.**

## WARNING!



- Check local fire restrictions and don't build a campfire at a site with dry conditions.
- Make your campfire in a designated area only, and keep your campfire small and under control (for fire safety see page 78).
- Always keep water nearby to put out fire.

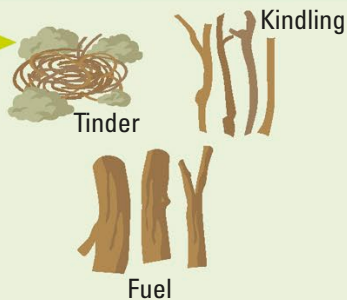
Keep water, sand, or soil handy to put out the fire.

Dead branches snapped off trees make good kindling.

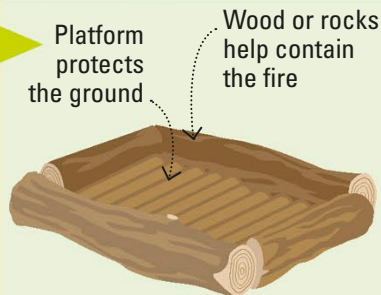


Do rake dry twigs and leaves well away from the fire using feet or a branch, not your hands.

## STEP BY STEP



**1** Gather the materials you need to light your fire: tinder, kindling, and fuel (see pages 94–95). You'll need more than you think, so multiply everything by ten!



**2** Choose the place for your fire and clear the ground of dry leaves and twigs. Lay a platform of green wood. Use four larger bits of wood to contain the fire.



**3** Place the tinder on the platform and make sparks to light it (see page 95). Let the flame catch. Gently lay kindling on the flame so it looks like a teepee.





Keep fire away from overhanging tree branches and leaves.

Do not position the fire where wind will blow smoke into your shelter.

Regularly add pieces of fuel to keep the fire burning.

Control your fire and make sure you don't set fire to anything you don't mean to, such as exposed tree roots.

**5** Continue to add two pieces of fuel at a time to create a "log cabin" effect. The fire is established when it can be left for five minutes without going out. Remember to never leave a fire unattended.

Do not build your fire close to old logs and fallen trees.



**6** Before you leave the campsite, douse your fire thoroughly with water. Make sure all the embers are out.



**4** As the kindling catches fire and the flames grow, add larger pieces of kindling, gradually building up to larger fuel logs. Fanning the flames with a map gives the fire extra oxygen.

# SURVIVE A FIRE

**Hotter, drier summers** around the world in recent years have increased the **risk of wildfires**. When vegetation on the ground is **tinder dry**, the slightest **spark** can start a fire that quickly sweeps through a forest.

**ALWAYS PUT OUT  
CAMPFIRES—ONE  
SPARK CAN START  
A WILDFIRE.**



**3** The direction of the smoke tells you which way the wind is blowing. Wind chases fire, so getting up-wind of a wildfire is safer. Fire is drawn faster uphill, so don't go up.

## STEP BY STEP



**1** If venturing into a forest, check local radio reports for fire risk and carry a mobile phone. Let others know your route and have an evacuation plan.



**2** Stay alert to signs of fire. You'll smell a fire first, hear it crackling, and see clouds of smoke, or ash falling from the sky, before seeing it. Don't panic but don't hang around.



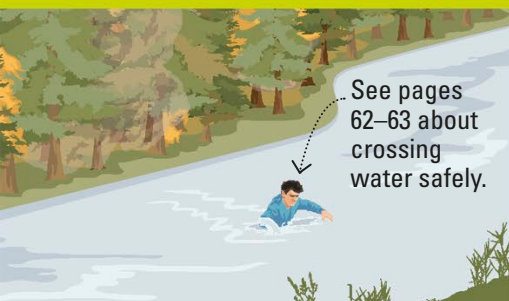


## DO'S AND DON'TS

Humans cause more than 80 per cent of forest fires. Campfires are a common cause – never leave them unattended. See pages 78–79 on camp safety.

- ✓ Check local fire restrictions and don't build a campfire at a site where conditions are dry.
- ✓ Make your campfire in a designated area only.
- ✓ Keep your campfire small and under control.
- ✓ Allow your campfire to burn completely to ash. To extinguish it, douse it with water to drown all embers. Keep pouring water on it until the hissing sound stops and make sure everything is cold to the touch before you leave.
- ✓ Never leave a fire unattended.

If the wind is blowing towards the fire, move quickly into the wind.



See pages 62–63 about crossing water safely.



Remember to leave a space to breathe.

Dampen clothing and cover yourself with dirt.

**4** If the wind is behind the fire, it will move very fast. A wildfire needs fuel, so look for an area without fuel such as a river, clearing, or road.

**5** If you can't escape, get as low as possible. Dig a trench in damp soil and lie face down with your feet facing the flames. Hold your breath as the fire goes over you.

WIND  
DIRECTION



# THE IMPORTANCE OF WATER

Water is essential to life. It is needed for **every physical and chemical process** that takes place in your body. You need a **steady supply** of water to sustain yourself in a survival situation, and **without it you will dehydrate**.

**ALWAYS CARRY A WATER BOTTLE THAT CAN PURIFY WATER.**

**Nose, mouth, and eyes**  
Water keeps soft tissues such as the mouth, nose, and eyes moist.

**Lungs**  
Water helps to moisten the lungs and assists breathing.

**Liver and kidneys**  
Water reduces pressure on the liver and kidneys as it flushes out waste products.

**Bladder**  
Water enables the bladder to flush out waste through urine.

**Bones**  
Water makes up approximately 22 per cent of bones.

**Skin**  
Water keeps the skin moist. The evaporation of sweat (water) from the skin also regulates body temperature.

**Brain**  
Water makes up approximately 80 per cent of the brain.

**Blood**  
Water makes up 83 per cent of blood and plays an important role in regulating blood pressure.

**Stomach**  
Water helps the body to digest food in the stomach and turn it into energy.

**Intestines**  
Water aids digestion and dissolves minerals and other nutrients to make them accessible to the body.

**Muscle**  
Water makes up 23 per cent of muscles.

**Joints**  
Water provides cushioning for joints.





# WHAT IS DEHYDRATION?

101

Dehydration occurs when you fail to **replace the water that your body loses**. It's vital to **recognize the symptoms early**. Dehydration can be caused by high and low temperatures, humidity, exercise, fitness levels, injury, and sickness.

## PREVENTING DEHYDRATION

- Don't wait until you feel thirsty to drink.
- Drink water often, in small sips rather than big gulps.
- Make sure water is within easy reach, day and night.
- Don't skip meals – a lot of water comes from our food.
- Avoid eating protein-rich food as it requires more water to digest.
- Be aware of how much fluid you are losing through sweat, especially when in a warm climate or exercising, and drink enough to compensate.
- You lose a lot of fluid by vomiting, high fever, or diarrhoea, so make sure you drink plenty of fluid following illness. You can also dissolve rehydration salts in water to speed up recovery.
- Drink enough water so that your urine is colourless or pale yellow.
- In a survival situation, you will need at least three litres of water a day – increasing with higher temperatures and physical exertion.
- Regularly check other people in your group for signs of dehydration.

## SYMPTOMS OF DEHYDRATION

- Thirst – if you feel thirsty you are already at least two per cent dehydrated.
- Fatigue – dehydration causes your blood volume to drop, which means the heart has to work harder to pump oxygen around the body.
- Headache – when you become dehydrated your brain tissue loses water.
- Muscle cramps – reduced blood flow caused by dehydration can lead to cramp.
- Not passing urine, or passing very dark urine – you should pass urine regularly and it should be colourless or pale yellow.
- Light-headedness or nausea – when you're dehydrated, your blood volume drops, which lowers the flow of blood and oxygen to the brain.
- Dry skin – if your skin is dry, cracked, or flaky, it's likely to be a sign that your skin cells aren't getting enough water.
- Rapid breathing – when you are dehydrated the body struggles to provide cells with the energy they need, which can cause you to breathe more quickly to compensate.

## WARNING!



- If you don't drink enough water, you will eventually die from dehydration. Always carry enough water with you on any expedition.
- If you run out of water, never drink untreated water from sources such as rivers, lakes, streams, ponds, or springs – it could be contaminated. See pages 102–103 to prepare water for drinking safely.

# COLLECTING WATER

**Collecting water as it falls** is the safest way of getting water in a survival situation. It will need no treatment before drinking, as long as the **collecting device** itself has not been **contaminated**. Any **non-porous material** such as a tarpaulin, poncho, or flysheet can be used to catch rainwater.

WE TAKE WATER FOR GRANTED, UNTIL WE HAVE NONE - THEN FINDING IT IS CRUCIAL.





# PURIFYING WATER

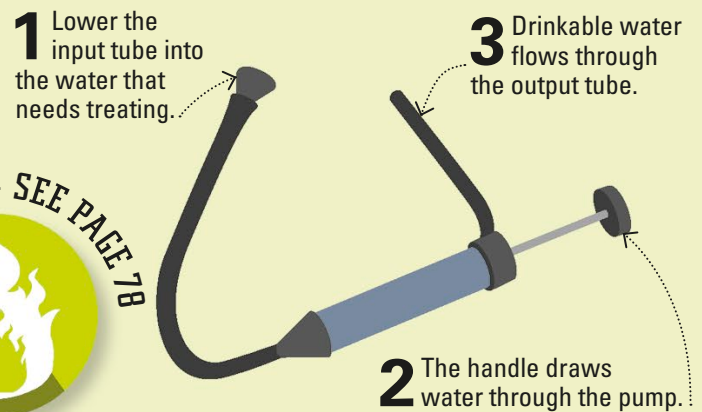
103

Water from sources such as lakes or rivers may look clean, but it could be **contaminated with harmful bacteria, parasites, and viruses**, which you cannot see. **Always filter and disinfect water before drinking it.** If you are able to **start a fire** and have a fireproof container, the best way to make water safe to drink is to **boil it**, but there are other ways to filter and purify water.

## WARNING!

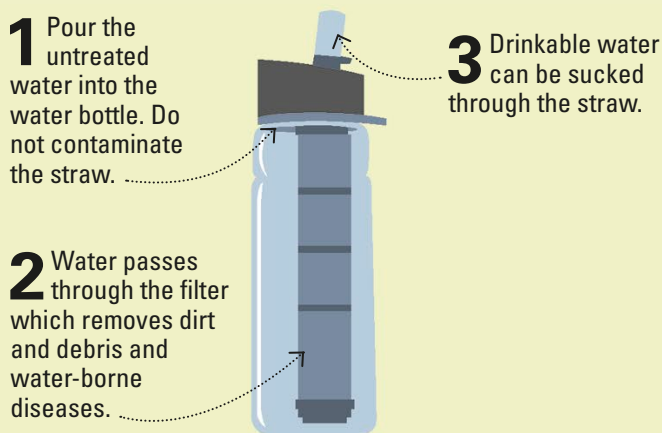


- If you drink untreated water from sources such as lakes and rivers, you risk becoming infected with a water-borne disease.
- These methods for purifying water don't work for salt water (see pages 70–71).



**Boiling water** is the most effective way to purify it. First, **remove dirt and debris** by filtering the water through a piece of cloth, such as a cotton T-shirt. Then **bring it to a boil** for at least 60 seconds. Once it has cooled, it's safe to drink.

**Mini portable water filters** are specially designed units that filter water and purify it. They pump contaminated water through **micro filters** and contain **special chemicals** that purify it.



**Pressure filters** are sometimes incorporated into drinking bottles to purify water. The water flows through filters that **remove sediment and organic contaminants**, and a **special chemical kills water-borne bacteria and viruses**.

**Purification tablets** typically contain chlorine, chlorine dioxide, or iodine. These chemicals **deactivate bacteria, viruses, and parasites**, rendering them harmless and making the water safe to drink. Always follow the instructions on the packet.

# THE IMPORTANCE OF FOOD

Your body needs **food for energy**. If you are healthy you can survive for weeks without food, but you will get hungry and weaker day by day. In a short-term survival situation, **obtaining food** is not a high priority, but it is always a good idea to pack some **basic emergency rations**.

## WARNING!

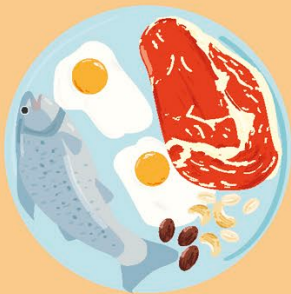


Some plants and mushrooms are edible, but identifying them can be difficult. Never eat plants or mushrooms that you find in the wild – it can be fatal.

## WHAT DO YOU NEED TO EAT?



**Carbohydrates** provide you with your main source of energy for breathing, movement, and warmth. There are two main types: sugars – found in food such as fruit, honey, sweets and chocolate, and starches – found in food such as bread, rice, and pasta.



Your body needs **protein** to fight off disease and to build, maintain, and repair the muscles and other tissues and organs in your body. Good sources of protein include eggs, meat, fish, nuts, seeds, and dairy products.



**Fat** provides your body with a concentrated source of energy. It provides more calories per gram than any other nutrient, and it is more difficult to burn. Good sources include cheese, butter, avocados, and nuts.

## EATING FOR SURVIVAL

- Always start the day with a good breakfast – it's like filling up your own fuel tank at the start of a trip.
- Pack a variety of food and snacks for the day that can replace the amount of carbohydrates, protein, and fat that your body is using.
- If you are physically exerting yourself, you will need to eat more food to compensate.
- If you feel your energy levels dropping do something about it straight away – stop for a break and have a snack such as some chocolate or a protein bar with a drink of water.
- Always pack enough food to last you an extra day – just in case things don't go to plan.
- If you have a limited supply of water, eat little and often as digestion requires water (see page 100).
- Always follow the food safety guidelines (see page 110) when storing and cooking perishable foods.





# MAKE A TRAIL MIX

105

A good trail mix can help you **replace the energy and nutrients** you use when outdoors. You can purchase ready-made trail mix, but it's also easy and great fun to **make your own**. Once made, you can **store** your trail mix in an **airtight container**. Before your next outing, **scoop portions into ziplock bags** so everyone in your group has their own supply to snack on.



**4** Scoop handfuls of the trail mix into sealable bags, ready to dip into and snack on when you are on your adventure.

## STEP BY STEP



**1** Making your own trail mix is quick and easy. First wash your hands. Then gather your favourite trail mix ingredients, such as edible nuts, seeds, dried fruit, chocolate, and cereal.



**2** Take a large bowl or container. Measure equal quantities of nuts such as cashew nuts, almonds, and Brazil nuts and add them to the bowl. Add sunflower seeds and pumpkin seeds.



**3** Add chocolate chips, dried fruit such as raisins and cranberries, and dried cereal for sweetness. You can also add popcorn. Mix it all together.

# NET A FISH

Fish are **high in protein** so are a great food source. Once you have made a **trap**, or **baited and set a fishing line**, it works for you 24/7 with no additional effort, which means you have extra energy for other survival tasks. **Netting fish** can also be a simple and effective way of catching fish – and is fun!

**FISH LIKE DEEP, STILL WATER, ESPECIALLY IN SHADOWY BENDS.**

**4** Place the net into the water where you see fish. Let the fish swim over or into the net. Be patient.

COOK A FISH - SEE PAGES 110-111

A dipping net will catch small fish at the edges of streams and lakes, particularly where trees cast shadows over the water.

Take care near banks of water – they can be slippery.

## STEP BY STEP



**1** Cut two small nicks in a T-shirt's hem and push the forks of a branch through them. If no hem, cut evenly spaced holes and push the branch in and out of them.



**2** Cut another nick in the side of the hem where the forks meet, pull them through, and bind them together with string or rope.



**3** Tie off the T-shirt above the armholes and neck. Cut off excess material, or invert the net, to reduce the size and prevent extra drag when netting.

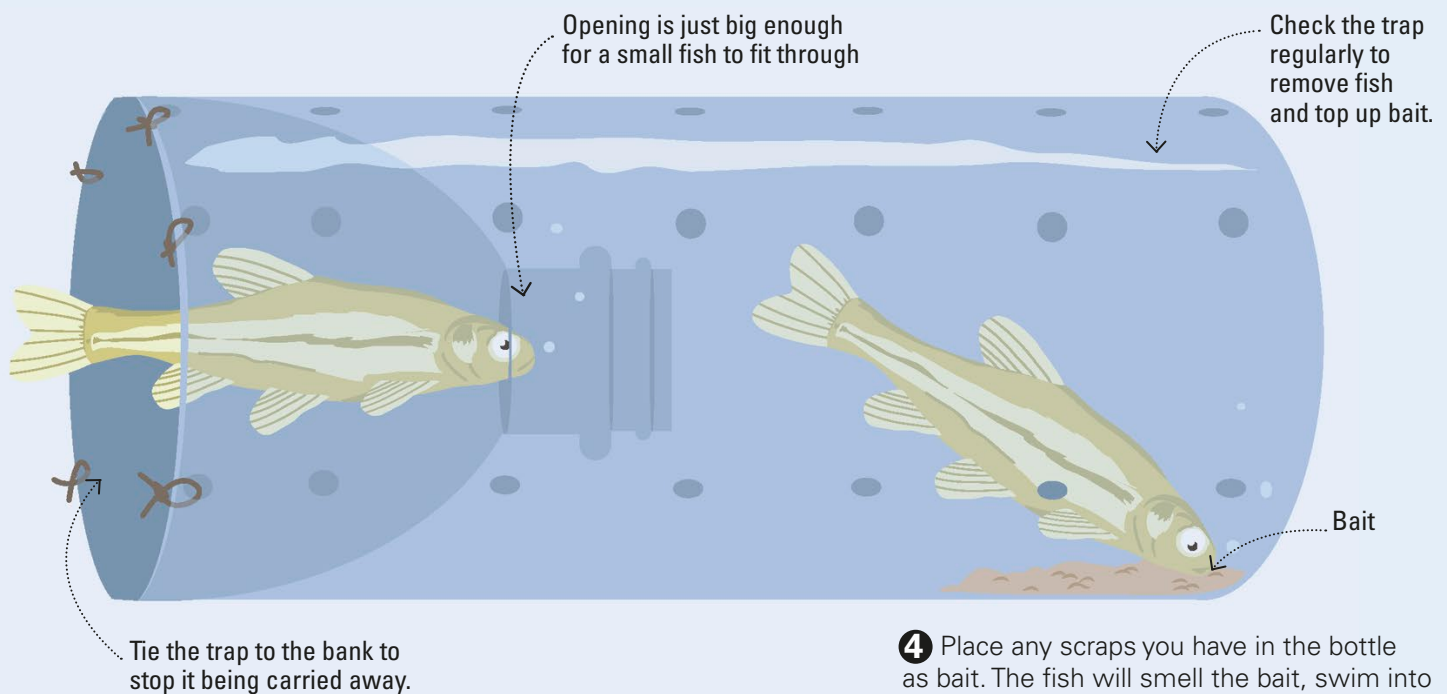


# MAKE A BOTTLE TRAP

107

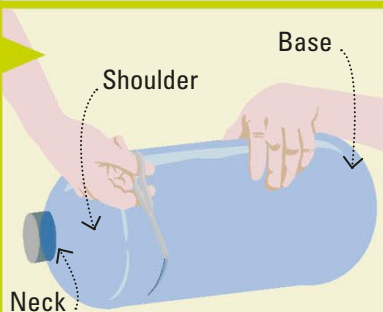
A **bottle trap**, also known as a “minnow trap”, is an easy way to **catch small fish**. The **inward-facing funnel opening** of the trap allows the **fish to get in**, but the small size of the opening means **they can't get back out again**. Lots of small fish can make a meal or be used as bait for bigger fish.

ONCE MADE AND BAITED,  
THIS TRAP WILL WORK  
FOR YOU ON ITS OWN,  
24 HOURS A DAY.

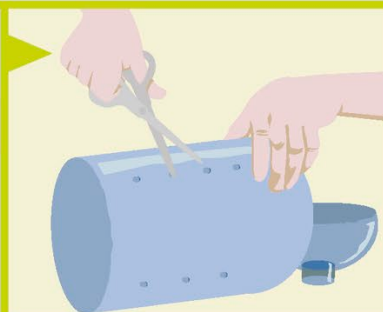


④ Place any scraps you have in the bottle as bait. The fish will smell the bait, swim into the bottle and won't be able to get back out.

## STEP BY STEP



① Using scissors or a knife, carefully cut off the top of a large, plastic bottle where the shoulder starts to narrow, making two pieces – a bottle neck and a base.



② Using the points of your scissors, carefully make lots of small holes in the bottle base so it will fill with water and sink. Make some holes near the open edge, too.



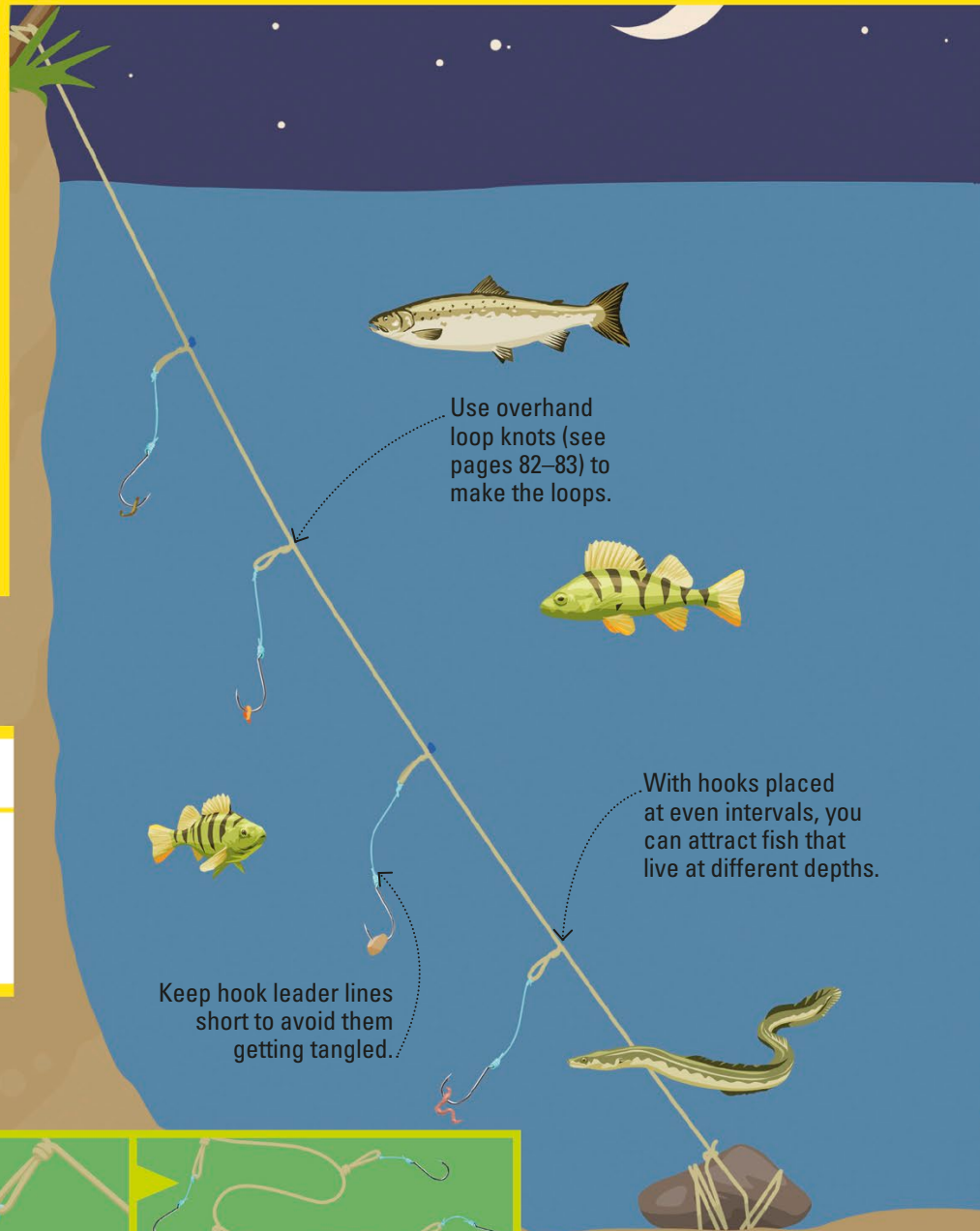
③ Make two holes on the neck, near the edge. Insert the neck into the base as above, lining up the holes with those on the base. Tie the two pieces together.



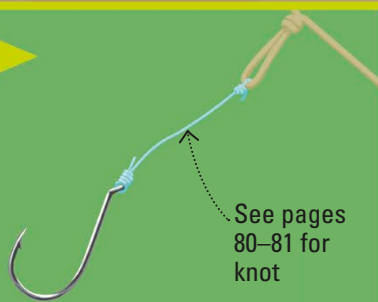
Fishing **equipment** can be made from all sorts of material. Your survival kit should have some fishing line and a few hooks, but if you don't have a kit you can improvise. You can use a stick as a **makeshift rod**, for example. Passive methods such as **night lines** mean that you can sleep, or do other tasks, while they work for you.

## NIGHT LINE

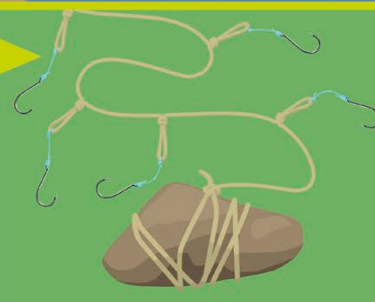
With hooks, a fishing line, and a rock, you can easily make a simple fishing device that will do the work for you.



## STEP BY STEP



**1** Make loops along the fishing line. Attach shorter leaders to each loop, and a hook to the other end. Use fisherman's knots for both.



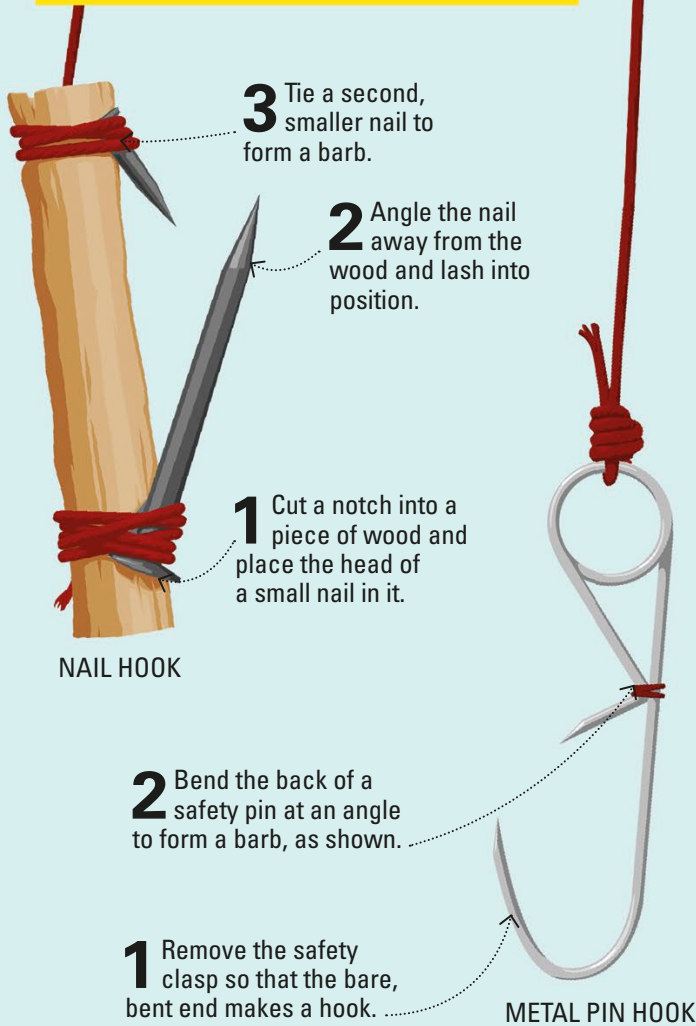
**2** After attaching all the hooks, making sure they are spaced evenly along the line, tie a rock to one end of the line to weigh it down.

**3** Tie the line to a post stuck securely in the ground at the bank's edge. Add the baits. Throw the line into the water and leave overnight.



## IMPROVISED HOOKS

Fishing hooks can be crafted from any piece of metal, such as a nail, needle, wire, or safety pin.

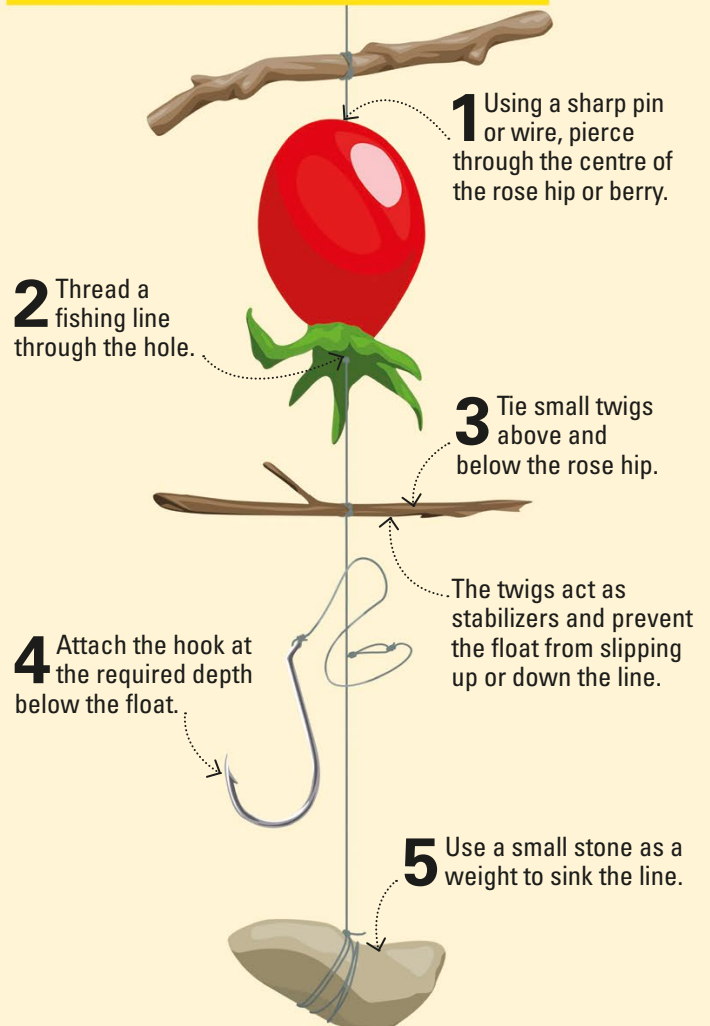


NAIL HOOK

METAL PIN HOOK

## FLOATS

You can make a float from any natural material that floats – a piece of bark, a berry, or a rose hip, as shown here.



## TYPES OF BAIT



### Worms

Worms attached to a hook attract some fish. Caterpillars, slugs, or maggots also work.



### Insects

Insects such as crickets (above) and beetles are natural prey for many fish.



### Small fish

Some big fish eat smaller fish – catch small fry in a bottle trap like the one on page 107.



### Nuts and fruit

Tie small nuts, bits of bigger nuts, and small pieces of fresh or dried fruit to the hook, or pierce them.



### Food scraps

Bread, cheese, and pasta can work. Some fish will eat animal meat and guts.

# COOK A FISH

Fish are easier to prepare and cook than most animals, so should be a **first choice** for food if they are available. Fish **must be cooked** to **kill any parasites and bacteria**. Never eat a fish that does not look healthy – you can use it as bait instead.

**TO KILL A FISH, CLUB IT JUST ABOVE THE EYES WITH A HARD OBJECT.**

## DO'S AND DONT'S

Here are some key things to remember when preparing food outdoors. It is important to keep things clean to avoid getting sick.

- ✓ Food cooking can attract wild animals and insects, so cook away and downwind of your shelter site.
- ✓ Ensure your hands are cleaned before and after preparing and eating.
- ✓ Clean your pocketknife blade using alcohol wipes from your first aid kit before using it on any food.
- ✓ Take no chances, overcook rather than undercook any food.
- ✓ Eat food straight after cooking it, and ideally downwind of your shelter site.
- ✓ In a survival situation there are no such things as leftover scraps of food. Eat everything – it is fuel your body needs.
- ✓ Wash all cooking pots and utensils in hot water if you have it, otherwise wash in running water to remove residue that could develop infectious germs.



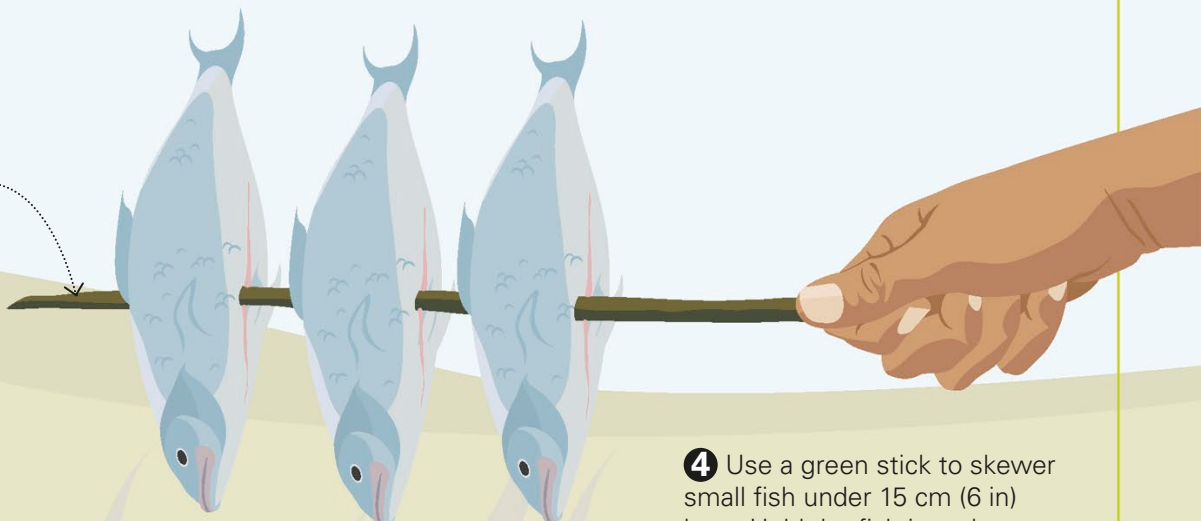
## STEP BY STEP



- 1 Hold the fish by its tail and scrape off the scales, holding the knife blade away from you and moving towards the head.

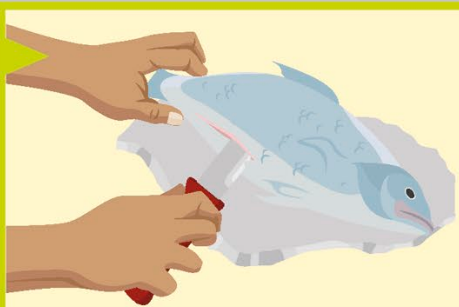
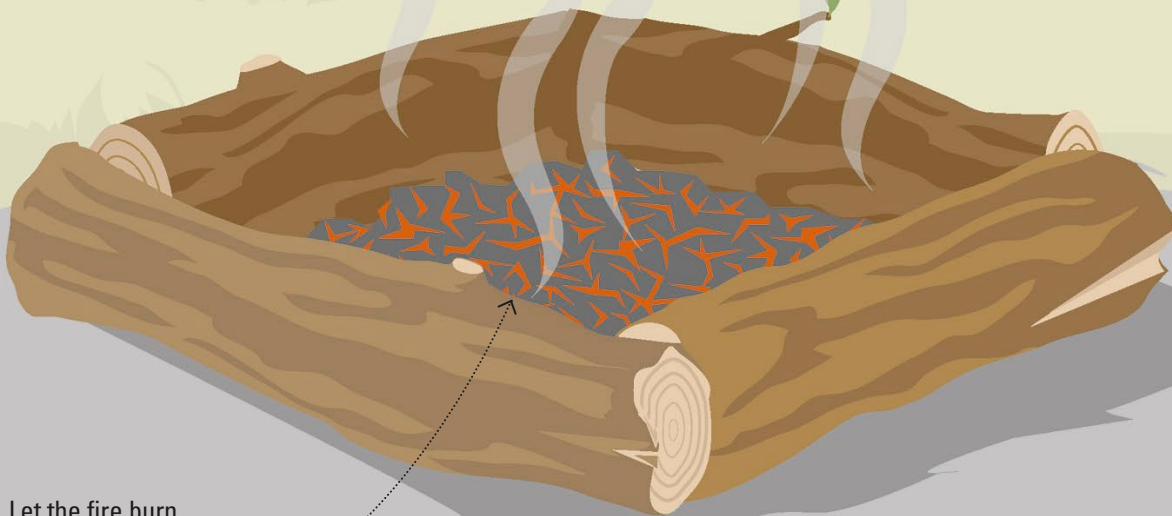


Use a green stick – not a stick that is dead or dried, which may burn up.



**4** Use a green stick to skewer small fish under 15 cm (6 in) long. Hold the fish just above the embers of a fire until the flesh turns opaque (you can't see through it) and flakes.

Let the fire burn down to embers, like a barbecue, before cooking the fish.



**2** Hold the fish, belly towards you. Holding the knife blade away from you again, insert the knife point into the anal orifice and slit open from belly to throat.



**3** Pull out all of the internal organs and wash the fish thoroughly inside and out. Keep the organs to use as bait.

## WARNING!



- Make sure you don't touch your eyes – fish slime may contain harmful bacteria.
- Always wash your hands before and after handling fish.
- Use a stick from a tree you can identify. Some sticks are harmful to use as a skewer for cooking.



# CHAPTER 4

# FIRST AID

A BASIC UNDERSTANDING OF FIRST AID IS ESSENTIAL IN THE WILD. MOST MEDICAL PROBLEMS, SUCH AS DEHYDRATION, CAN BE AVOIDED BY RECOGNIZING EARLY SYMPTOMS AND PREVENTING THEM DEVELOPING.

## Essential kit

You can buy a ready-made first aid kit, or put together your own. If you can, go on a first aid course to learn and understand more skills.





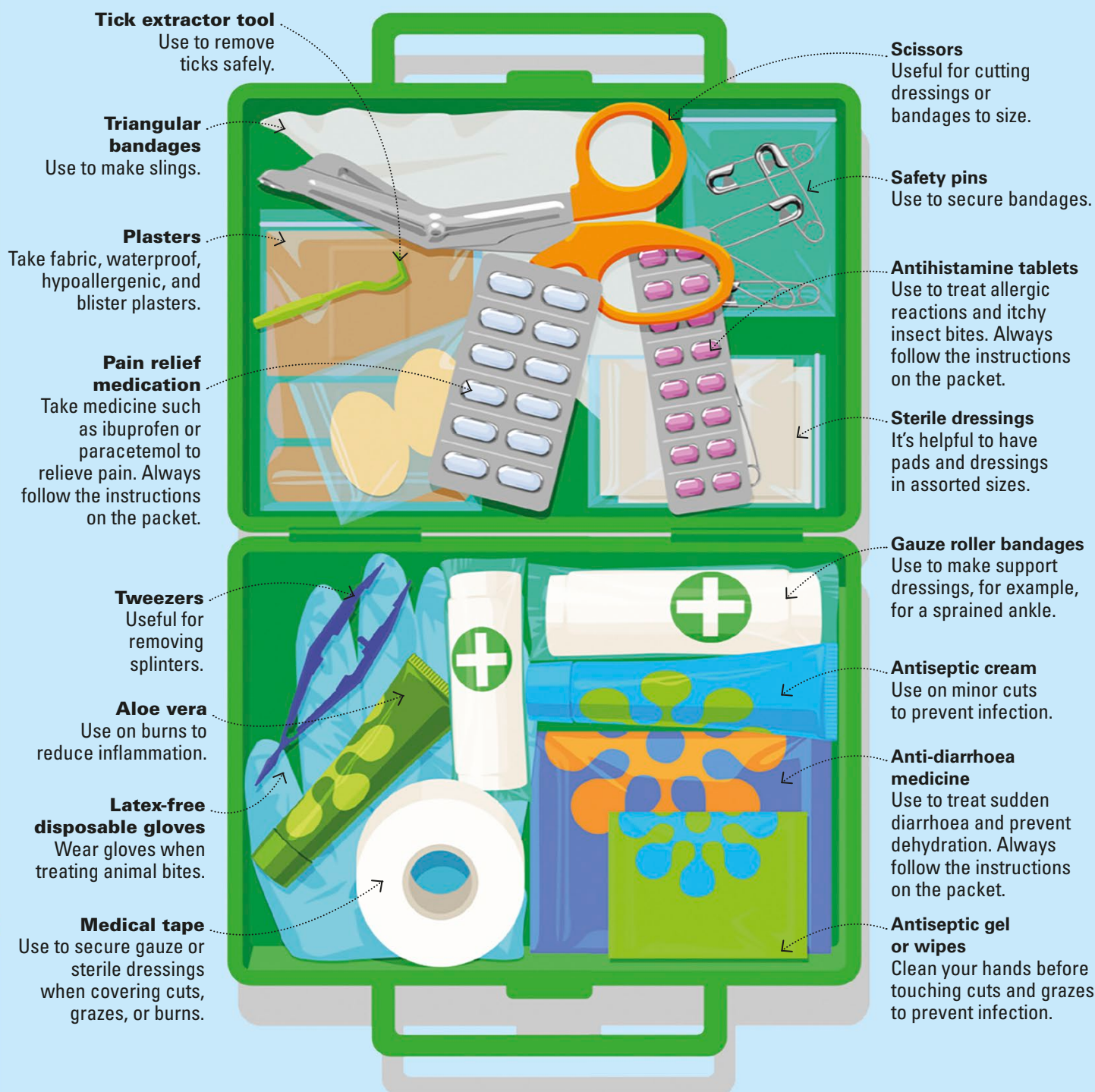




# FIRST AID KIT

Safety is key on any expedition. Before you set off make sure you have an understanding of **basic first aid** and all the **necessary medications and equipment** you might need. Check the seals on sterile dressings; if they're not intact, they're not sterile. **Replace any kit as soon as you use it.**

**KEEP YOUR FIRST AID KIT DRY AND READILY ACCESSIBLE.**





# TREATING A MINOR CUT

115

Any break in the skin, however minor, needs to be **cleaned and protected** immediately to **prevent infection**. Any bleeding can be distressing, but it can usually be controlled by a combination of **direct pressure and raising it**. When working with a knife, always have a first aid kit with you. If the cut is **severe**, seek **urgent medical help**.

**FOR SMALL CUTS  
USE A PLASTER,  
OTHERWISE USE  
A STERILE PAD  
AND BANDAGE.**

Dressing pad should be larger than the wound.

Check the circulation behind the pad every 10 minutes, by pressing the skin around it.

## STEP BY STEP



**1** Sit the injured person down, in case they faint. Rinse the wound with clean, cold water and pat dry with a sterile cloth.



**2** Cover the cut with a gauze bandage. Apply pressure to the injured area and raise it above the heart to help stop the bleeding.

**3** Cover the cut with a sterile dressing pad and bandage. To check the bandage is not too tight, press the skin around it. If the colour does not return quickly, you need to loosen it.

Many bites and stings are painful, but most can be treated with **simple first aid**. However, there is a risk of an **allergic reaction** called **anaphylactic shock**. If you develop a blotchy red rash, watery or puffy eyes, or experience breathing difficulties, **seek urgent medical help**.

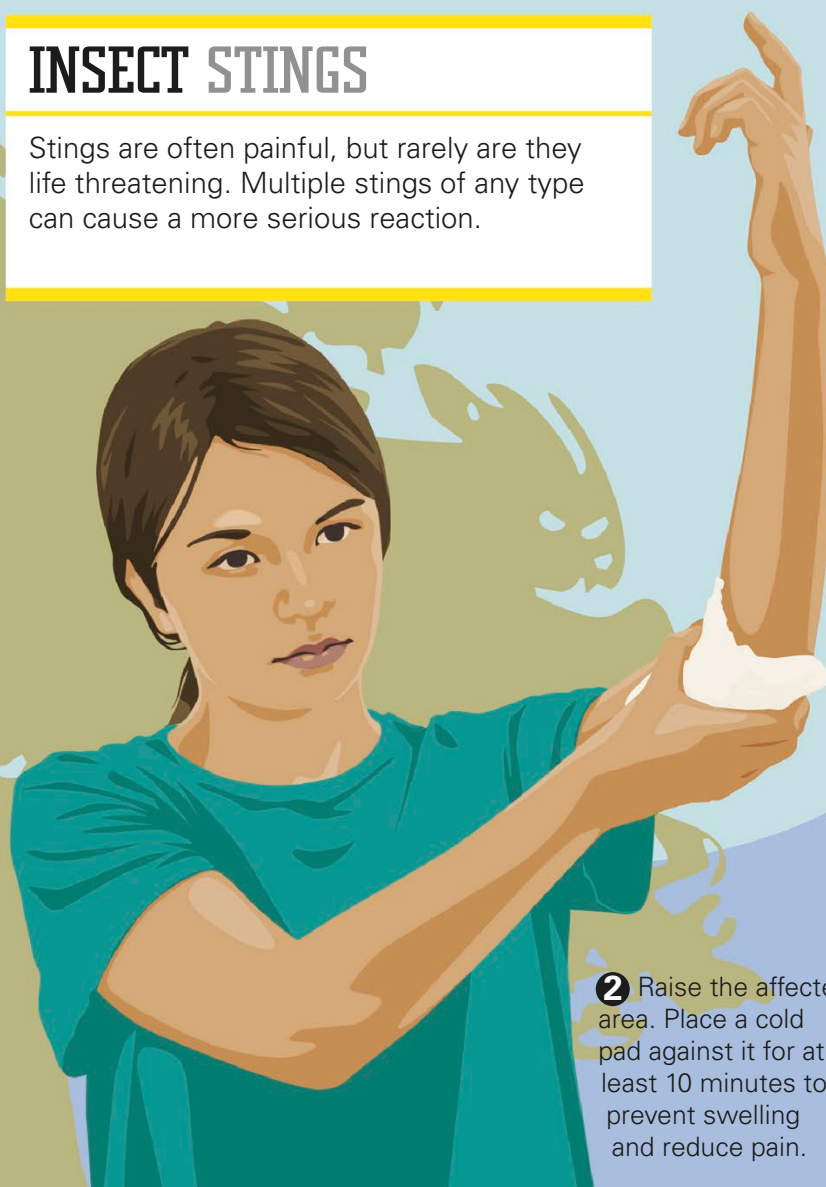
## INSECT STINGS

Stings are often painful, but rarely are they life threatening. Multiple stings of any type can cause a more serious reaction.

### STEP BY STEP



**1** If the sting is visible, scrape it off sideways with a fingernail or small plastic card. Do not squeeze the sac, as you may squeeze venom or infection into the area.



**2** Raise the affected area. Place a cold pad against it for at least 10 minutes to prevent swelling and reduce pain.

## STINGS FROM SEA CREATURES

When touched, some sea creatures, such as jellyfish and sea anemones, release venomous cells that stick to skin. Other sea creatures, such as sea urchins, have sharp spines, which if trodden on become imbedded in skin and can cause infection.



### Jellyfish

Carefully remove the tentacles and wash the area with vinegar or saltwater. Any signs of shock or an allergic reaction will require emergency medical help.



### Sea urchin spines

Immerse the injured area in water as hot as can be tolerated for about 30 minutes. Get medical help to remove the spines.



## MAMMAL BITES

Mammal bites carry a serious risk of infection because an animal's mouth harbours many germs.

**1** Wear sterile gloves and wash the area thoroughly with a clean gauze bandage and water.

**2** Pat dry and cover the wound with a sterile dressing.

**3** Visit a doctor to check for infection.

## TICK BITES

Ticks are tiny, spider-like parasites that feed on blood by attaching themselves to skin. It is important to remove ticks quickly and safely using a special tool, as they could be infected with Lyme disease. See a doctor if you develop flu-like symptoms or a red rash.

**1** Slide the hook of a tick extractor tool along the skin to grab the tick. Be careful not to squeeze the body.

**2** Raise the hook very slightly and rotate it to lift the tick clear.

**3** If the area develops a circular red rash in the next 3–30 days, see a doctor.



## SNAKE BITES

You can treat a snake bite with first aid, but call emergency services first. To prevent the venom from spreading, keep the person calm and as still as possible until emergency services arrive. Relatively few snakes are venomous, but it is safer to assume that all of them are.

**3** Immobilize the limbs by tying them together with folded bandages. Tie knots against the uninjured limb.

**1** Move the casualty out of striking distance of the snake then help them to lie down with their head, chest, and shoulders supported.

**4** Tie another bandage around the affected limb that extends from the bite, as far up the limb as possible.

**2** Do not wash the injured area. Cover it with a bandage.

Ensure the heart is raised higher than the injury.



# SPRAINED ANKLE

Strains and sprains are **common injuries** when out walking. A **sprain** is the **overstretching or tearing of ligaments** – the bands of tissue that connect two bones together in a joint. A **strain** is the **overstretching of muscles or tendons**.

## STEP BY STEP



- 1 Raise the injured area and rest it on something for support. Wrap a cold compress around it for at least 10 minutes to reduce swelling and bruising.

## DEALING WITH CRAMP

Cramp is painful muscle spasms caused by dehydration and a reduction in body salts through sweating. Drink water regularly to stay hydrated (see pages 100–101).



### Foot

Take the weight off the affected foot and gently stretch the muscles to reverse the spasm. Once the cramp has eased, massage the affected area.



### Thigh

If the cramp is in the back of the thigh, straighten the leg to stretch the muscle. If it's in the front of the thigh, bend the leg. Once pain has eased, massage the affected area.



- 2 Leave the compress in place or wrap padding around the injury. Apply a gauze bandage starting below the injury and continuing to the next joint. Avoid putting weight on the injured limb. Use crutches or lean on someone if you have to move.



# MAKE A SLING

119

If you trip over, you tend to use your hands to break the fall. This can result in a **broken wrist, forearm, upper arm, or collarbone**. If this happens, you need to **support the injury** by using a **sling** until you can get medical help. If the arm cannot be bent, it may be a broken elbow – in which case, **wrap padding around the joint** and **secure the arm to the body**.

ALMOST ANY  
PIECE OF CLOTH  
CAN BE USED  
TO MAKE  
SLINGS.

③ Take the end of the bandage behind the neck to meet the other end.

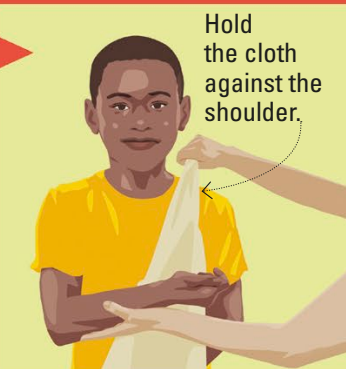
A properly tied reef knot will not come undone.

④ Tie ends together in a reef knot (see pages 80–81) above the collarbone on the uninjured side.

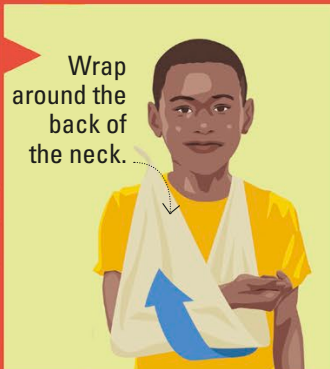
The elbow should be cradled, too.

Use the uninjured arm to support the injured one.

## STEP BY STEP



① Fold a cloth, ideally about 1 sq m (11 sq ft), into a triangle. While supporting the injury, slip one end of the cloth under the injured arm, and the other end over the opposite shoulder.



② Wrap the end that's hanging down up and over the injured arm, making sure it covers the elbow, too.

## COLLAR AND CUFF SLING

The smaller loop supports the injured arm.



Use a belt or tie to make a simple collar and cuff sling. Fasten the item to form a loop. Place it over the head, then twist it once to form a smaller loop at the front. Place the injured arm through the smaller loop.

**Vomiting and diarrhoea** can be serious because they cause your body to lose **essential fluid**, leading to **dehydration**. If you feel nauseous, or experience vomiting or diarrhoea, you should rest, keep warm, and replace lost fluids.

**2** Drink clear fluid, starting with small sips, gradually drinking more.

**1** To control vomiting, avoid solid food. Then eat bland, light food such as crackers.

**3** Find somewhere safe to sit or lie down and rest until you feel better.

## WARNING!



- If you have a fever, severe belly pain, or prolonged (more than 24 hours) vomiting or diarrhoea, or if you see blood in your vomit or diarrhoea, seek urgent medical attention.
- When using medicines, always follow the instructions on the packet.

## CAUSES OF SICKNESS

### Heat exhaustion

Being in the sun for long periods of time can cause heat exhaustion and nausea (see page 52). Always wear a hat when you are out in the sun, drink plenty of water, take regular breaks, and seek shade if you feel yourself overheating.

### Dehydration

Not drinking enough water can cause you to feel unwell and dehydrate (see pages 100–101). You must replace lost fluid from sweating, vomiting, or diarrhoea by drinking water in small sips rather than big gulps.

### Stomach bug

Coming into contact with bacteria in the wilderness can cause sickness and diarrhoea. To prevent the spread of bacteria, wash your hands with soap and water before you eat and after you go to the toilet, or use a hand sanitizer.

### Food poisoning

When food is not cooked or stored properly it can become contaminated with bacteria (see page 111). You may feel the effects within a few hours and you will often be sick or have diarrhoea. Lie down and rest, and drink plenty of water in small sips to prevent dehydration. If you feel hungry, eat plain food such as crackers, rice, bread, or pasta.





# BURNS AND BLISTERS

121

There is a serious **risk of infection** with all scalds and burns. They may only affect the outermost layer of skin, the upper layers, or the full thickness. If a scald or burn is **larger than your hand**, then it needs **hospital treatment**.

**1** Cool the injury for at least 10 minutes by dousing it with cool water. This will reduce pain and swelling.



STEP  
BY  
STEP



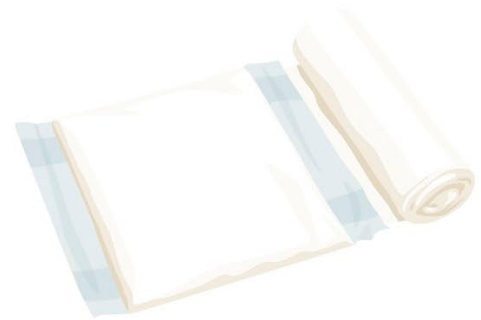
**2** Protect the injury to reduce the risk of infection. Cover the entire area with a clean, sterile, non-fluffy material or dressing. Cover the burn loosely and take care not to burst any blisters.

## TREATING BLISTERS

A blister is a fluid-filled “bubble” of skin that occurs when skin is burned or rubbed repeatedly against a surface (a friction burn).

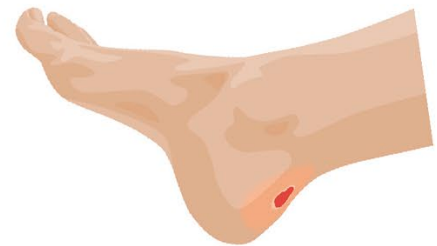
### Cover

To protect a blister from infection while it heals, cover it with a sterile dressing or blister plaster, or wrap gauze or a bandage loosely around the area. Never attempt to burst a blister yourself.



### Fresh air

When you are not on your feet, remove the gauze or bandage to allow fresh air to reach the blister. This will help it to dry up and promote faster healing.



### Reduce inflammation

Aloe vera has soothing, anti-inflammatory properties that make it excellent for treating blisters and reducing the redness and swelling that cause pain.



CHAPTER  
5

# GLOSSARY AND INDEX









**allergic reaction** Sensitivity to a normally harmless substance, which causes the body's immune system to overreact. Symptoms commonly include a rash, sneezing, or swelling.

**anaphylactic shock** A highly dangerous allergic reaction to a substance such as insect-sting venom or a particular food.

**antennae** The pair of sensory organs, or feelers, on the heads of insects that are used to touch, smell, taste, and detect air movement.

**bait** Food placed on a fishing hook, or in a net or trap, to entice fish or other animals.

**bearing** The horizontal angle, measured in degrees, between an object and True North (north according to Earth's axis).

**bight** A loop of rope; also a curve in a geographical feature, such as a coastline.

**bothy bag** A large, waterproof bag used for protection or shelter.

**cairn** A human-made mound of stones built to mark a trail and be visible in fog.

**canoe** An open-deck paddle boat for one or more people.

**capsized** Of a boat, overturned in the water.

**cardiac arrest** Sudden stoppage of the heartbeat, which may be temporary or permanent.

**carnivore** An animal that eats other animals.

**carion** The rotting flesh of dead animals.

**cinch** In a knot, to cinch means to "make certain" by pulling the knot tight.

**climate** The most common weather conditions in an area in general, or over a long period.

**constellation** A named group of stars that can be seen from Earth.

**contamination** The process of making something dirty, polluted, or poisonous by adding waste, chemicals, or infection.

**contour lines** Lines on a map that mark the changing height of the natural features of land.

**compass** An instrument used for orientation and navigation, using a freely rotating needle that indicates the direction of north.

**cordage** Lightweight rope.

**current** Strong movement of water in one direction.

**dehydration** A dangerous lack of water in the body caused by not drinking enough, or by sweating, vomiting, or diarrhoea.

**detritus** Discarded waste or debris; also material, such as rock fragments, caused by erosion.

**disinfect** To clean something to destroy any germs it may have.

**downstream** In the same direction that a river or stream is flowing.

**dune** A hill of sand on a beach or in a desert.

**erosion** Gradual wearing away of soil or rock by wind, water, or ice.

**exertion** Physical effort or exercise.

**fatal** Causing death by, for example, injury or illness.

**fleece** A soft, warm fabric used for clothing or as a lining material.

**flysheet** A waterproof sheet placed over a tent to add an extra layer of protection.

**geocaching** A treasure-hunting game played using GPS devices. Containers, called caches, are hidden in locations outdoors for players to try to find using GPS coordinates.

**grid reference** A number and letter used to pinpoint a specific location on a map.

**hand sanitizer** A liquid or gel that kills bacteria and germs.

**hazard** Something that could put you in a dangerous situation or cause an accident or illness.

**heatstroke** A serious medical condition caused by severe overheating.

**hemisphere** The northern or southern half of Earth divided by the equator, or the western or eastern half, divided by an imaginary line passing between the north and south poles.

**hyperventilation** Breathing much faster and deeper than normal. Symptoms include dizziness and feelings of panic.



**hypothermia** A life-threatening drop in body temperature.

**infection** A disease caused by bacteria, viruses, or parasites.

**inflammation** Painful redness and swelling caused by infection, burns, injury, or illness.

**lashing** A simple technique used to tie two things (for example, poles) together.

**latticework** Crossed-over strips of material, typically wood or metal, in a diagonal pattern.

**lee side** The side of something, such as a hill or tree, that is sheltered from the wind.

**legend** On a map, the key or information that explains symbols or colours.

**lichen** A tiny moss-like plant that grows on surfaces such as rocks, trees, and walls.

**ligament** A band of tissue that connects two bones together in a joint.

**malaria** A serious disease that is spread by mosquitoes in many tropical regions.

**marsh** An area of low-lying land that is often flooded and typically remains waterlogged at all times.

**navigation** The process of planning a route and finding a specific place using a map, compass, or GPS device. Natural features such as the Sun, Moon, and stars can also be used for navigating.

**omnivore** An animal that eats both plants and other animals.

**orbit** The circular path an object in space takes around another object when affected by its gravity.

**paracord** A slim, lightweight nylon rope, useful for lots of outdoor activities, for example, building a shelter.

**paralysis** The loss of muscle function and movement in a part of the body. It can be temporary or permanent.

**parasite** An organism that lives in or on another organism, known as the host, and often harms it.

**Polaris** The alternative name for the North Star, the star almost directly above Earth's north pole, which is often used for navigation.

**prevailing wind** A wind that blows predominantly from a single direction.

**prey** An animal that is hunted by another for food.

**repellent** A substance that deters insects or an animal from approaching closely.

**satellite** An object that is sent into space to orbit Earth to send and receive information.

**scald** An injury caused by very hot liquid or steam.

**scat** The droppings of any wild animal.

**sterile** Completely free of bacteria or any other microorganisms.

**tarpaulin (tarp)** A hard-wearing, waterproof sheet.

**tendon** A dense, fibrous cord of tissue that connects bone to muscle.

**terrain** The physical features of an area of land.

**topography** The features of an area of land, typically natural formations such as mountains, rivers, lakes, and valleys.

**trail mix** A mixture of dried fruit and nuts often eaten as a snack.

**treading water** Staying afloat in water in an upright position by moving the feet with a walking motion.

**upstream** In the opposite direction to which a river or stream is flowing.

**vegetation** Plants, particularly those found in a specific area.

**venomous** Describing an animal, such as a snake, that can inject venom (poison) through a bite or sting.

**virus** A disease-causing microbe that infects the cells of living things.

**A**

action plans 30–1  
A-frame shelters 86  
allergic reactions 116  
alligators 68  
anaphylactic shock 116  
animal encounters 46–9, 79  
animal signs 50–1  
arachnids 44–5  
avalanches 60–1

**B**

bait, fishing 108–9  
beaches, and quicksand 53  
bears 46, 51  
bee species 44  
black bears 46, 51  
blisters and burns 121  
bottle traps 107  
broken bones, slings for 119  
brown bears 46, 51  
burns and blisters 121  
button ties 89

**C**

campcraft 72–111  
campsite safety 78–9, 98–9  
choosing a camping spot 74–5  
fire 94–9  
food and water, obtaining and preparing 100–11  
hygiene 90–1  
shelter 84–9  
tent basics 76–7  
tools for 92–3

canoe rescue 66  
cattle 47  
cave shelters 84  
clothing  
  kit layers 9, 54  
  and weather conditions 52, 56, 58–9  
clouds 42–3  
cold water shock 67  
collar and cuff slings 119  
compass navigation 18–21  
constellations 24–5  
contour lines 16–17  
cooking a fish 110–11  
cougars 51  
cramp 118  
creepy-crawlies 44–5  
crocodiles 68  
cuts, minor 115

**D**

dehydration 71, 101, 120  
diarrhoea 120  
distress signals 34–7  
donut boats 64

**E**

elephants 49, 50  
emergency shelters 89

**F**

feather sticks 94  
fire  
  and campsite safety 78–9, 98–9  
  fires for signalling 36–7  
  making a 94–7  
  surviving a 98–9  
first aid 112–21  
  kit 114  
fishing 106–9  
  cooking a fish 110–11  
fitness trackers 29  
floats, fishing 109  
flotation aids 64–5  
food  
  cooking a fish 110–11  
  food poisoning 120  
  importance of 8, 104  
  trail mix 105  
footprints, animal 50–1  
footwear 56, 58  
forest fires 98–9

**G**

geocaching 28  
Global Positioning System (GPS)  
  28  
glow sticks 35  
GPS see Global Positioning  
  System (GPS)  
grid references 19



# H

heat injury 52, 58, 120  
 help, calling for 34–7  
 hiking skills 40–1  
   moving over snow 54–9  
 hippos 49  
 hollow shelters 85  
 hornets 44  
 hypothermia 54, 58

# I

ice 55  
 ice axes 57  
 insects 44–5  
   stings and bites 116–17

# K

kit layers see clothing  
 knives and saws, use and safety  
   92–3  
 knots 77, 80–3, 89  
   for a sling 119

# L

legend, map (key) 16  
 leopards 50  
 lions 50  
 location 8  
 lunar cycle 23

# M

magnetic variation 19, 21  
 mammal bites 117  
 man-made features 16  
   as signposts 26  
 maps and map reading 14–17  
 medications 114  
 midges and sandflies 44  
 minnow traps 107  
 mirrors, for signalling 37  
 mobile phones 29, 30, 34  
 Moon, navigating by the 23  
 moose 47, 51  
 mosquitoes 44

# N

natural features  
   maps 16  
   as signposts 26–7  
 natural shelters 84–5  
 navigation 12–36  
 netting fish 106  
 North Star (Polaris) 24  
 Norths, three different 21

# O

one-pole shelters 88

# P

personal hygiene 90–1  
 planning a route 32  
 Plough, the 24  
 pocketknives 92–3  
 pointer stars 24–5  
 Polaris (North Star) 24  
 pooing in the wild 90  
 protection 8

# Q

quicksand 53

# R

rafts, building 64–5  
 rhinos 50  
 riverbanks, and quicksand 53  
 rivers, crossing 62–5

# S

safety equipment 32  
 scalds 121  
 scat (droppings) 50–1  
 sea, surviving at 70–1  
 sea creatures, stings from 116  
 shadow method 22  
 sharks 69  
 shelters 84–9  
 showers, makeshift 91  
 sickness, dealing with 120  
 signalling for help 34–7  
 skis 54–5  
 sling, making a 119

smartphones, and GPS 29  
 snakes 49, 117  
 snow, moving over 54–7  
 snowshoes 54  
   making 56  
 solar stills 70–1  
 Southern Cross 25  
 spiders 44–5  
 sprained ankles 118  
 stars 24–5  
 stings and bites, treating 116–17  
 stomach bugs 120  
 Sun, navigating by the 22  
 survival tins 10–11  
   knives and saws 92–3

## T

tarp shelters 88  
 tent basics 76–7  
   see also shelters  
 ticks and tick bites 45, 91, 117  
 tigers 48, 51  
 topographic maps 16  
 torches 11, 35  
 trail markers 41  
 trail mix 41  
 tree shelters 87  
 trekking poles 40, 41

## V

vomiting 120

## W

wasps 44  
 water  
   cold water shock 67  
   collecting and purifying 102–3  
   dehydration 71, 101, 120  
   for hydration 8, 52  
   importance of 100–1  
 waterproof clothing 59  
 weather  
   and clothing 52, 56, 58–9  
   forecasting 42–3  
   see also winds  
 whistles 35, 47  
 wildfire 98–9  
 winds 42  
   direction of 26–7  
 wolves 51  
 wood saws 93

# ACKNOWLEDGMENTS

DK would like to thank the following for their assistance with this book:  
 Joanna Penning for the index.

### Picture credits

The publisher would like to thank the following for their kind permission to reproduce their photographs:

(Key: a-above; b-below/bottom; c-centre; f-far; l-left; r-right; t-top)

**2-3 Alamy Stock Photo:** Carrie Cole.

**4 Alamy Stock Photo:** Frode Koppang (tr); MITO images GmbH (cr). **5 Alamy Stock Photo:** NPS Photo (tl); Stas Tolstnev (clb); Kittisak Srithorn (c). **6 Alamy Stock Photo:** Frode Koppang. **12-13 Alamy Stock Photo:** MITO images GmbH. **38-39 Alamy Stock Photo:** NPS Photo. **72-73 Alamy Stock Photo:** Stas Tolstnev. **112-113 Alamy Stock Photo:** Kittisak Srithorn. **122-123 Getty Images:** Richard Hutchings.

All other images © Dorling Kindersley  
 For further information see:  
[www.dkimages.com](http://www.dkimages.com)